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PATENT AND TRADEMARK OFFICE NOTICES

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter 1—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received, and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published proposal—§§ 1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters which were contained in the published proposal, separate notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to § 1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to § 1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office OFFICIAL GAZETTE in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

PURPOSE OF RULES

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

REISSUE APPLICATIONS

Amended § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed with in § 1.175(a)(1) unless the applicant believes that to be the case. Section 1.175(a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended § 1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for § 1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by the patentee before a reissue application may be filed. The case law does not suggest that the approach of new § 1.175(a)(4) is inconsistent with 35 U.S.C. 251.[1] Inasmuch as 35 U.S.C. 251 is a remedial provision,[2] it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended § 1.11(b) opens all reissue applications to inspecting by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the OFFICIAL GAZETTE. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of the section will not be automatically open to inspection and will not be announced in the OFFICIAL GAZETTE. However, a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent informa-

[1] See *In re Clark*, 522 F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose uncited prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).

[2] See *In re Oda*, 443 F. 2d 1200, 170 USPQ 268 (CCPA 1971).

tion to the Office before the examiner's action, § 1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the OFFICIAL GAZETTE announcement of filing.

A substantial majority of the comments received favored adoption of § 1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of § 1.11(b) is for clarity. The word "furnished" is changed to "obtained" in § 1.11 for clarity.

PROTESTS AND PUBLIC USE PROCEEDINGS

Amended §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.[3]

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new § 1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to sumit additional written information or may provide extra time for comments by a protester to be filed.

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of § 1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of § 1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs[4] be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially beyond § 1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§ 1.291(c) and 1.292(b) for clarity.

In § 1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

DUTY OF DISCLOSURE

Amended § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored § 1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of § 1.56(a) is changed from the proposal by adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of § 1.56(a), is believed to provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of § 1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in § 1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial relationship. It appears to be more commonly used in court opinions. In addition, the third sentence of § 1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries v. Northway*.[5] Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

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[3] *International Paper Co. v. Fibreboard Corp.*, 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).

[4] 923 O.G. 2; 930 O.G. 1454; 938 O.G. 945.

[5] 426 U.S. ——, 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.

The definition of materiality in § 1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed § 1.56. The Court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an alvalanche of trivial information—a result that is hardly conducive to informed decision making." [6]

Although the third sentence of § 1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of § 1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of § 1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability—e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of § 1.56. The Patent and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New § 1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear at §§ 1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in § 1.56.[7] Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus § 1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from § 1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing § 1.56 to encompass conduct of this sort.[8] Moreover, § 1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In § 1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear than an intent to deceive (or gross negligence equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with § 1.56. Similar comments were directed to §§ 1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under § 1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In § 1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in § 1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended § 1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of § 1.65 to avoid confusion with the prior art statement of §§ 1.97 through 1.99.

Amended § 1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although § 1.346 is limited to papers filed in Office proceedings, the amendment to § 1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under § 1.348 for a groundless allegation of improper conduct in a court proceeding.

PRIOR ART STATEMENT

New §§ 1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in § 1.56. The sections have been substantially changed from the proposal, in response to comments received.

Unlike the corresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art statement is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§ 1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections 1.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in § 1.56. The only criterion contained in §§ 1.97 through 1.99 as to content of the art cited is in § 1.97(b). This subsection indicates that the statement will be construed as a representation that the prior art listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(b) makes clear that the prior art statement is not a representation that a search has been made or that no better art exists.

In § 1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possible.

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[6] 426 U.S. at——, 48 L. Ed. 2d at 765, 96 S. Ct. at 2132, 44 U.S.L.W. at 4855.

[7] See discussion accompanying proposed rules in Federal Register of October 4, 1976, page 43731, first sentence.

[8] *Norton v. Curtiss*, 433 F. 2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.[9] The name has been changed to reflect a change in the requirements of § 1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited. It is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

Other changes to §§ 1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

A notice published in 1974 [10] contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§ 1.97 through 1.99. In order to allow applicants, attorneys and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§ 1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.[11] It is hoped that with the duty of disclosure expressly set forth in § 1.56, applicants will perceive that it is to their advantage to use the procedures of §§ 1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as § 1.51(a) and adding new § 1.51(b) which contains a reference to §§ 1.97 through 1.99.

FOREIGN LANGUAGE OATHS

Amended § 1.52 and new § 1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the OFFICIAL GAZETTE at a later date.

The change in § 1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of § 1.69.

Although very few persons opposed §§ 1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure, § 608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filing an English translation of an oath or declaration filed under § 1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

DECISIONS AND FILES MADE PUBLIC

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act [12] required all decisions of the Office to be made publicly available. A greater number of those opposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation [13] under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions

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[9] E.g., Federal Register of September 9, 1968, 34 FR 14176, 866 O.G. 1402; S. 2255, 94th Congress, § 131(b).

[10] Notice of August 12, 1974, 926 O.G. 2.

[11] BNA's Patent, Trademark and Copyright Journal, No. 301, October 28, 1976, page D–1.

[12] 5 USC 552.

[13] *Irons v. Gottschalk*, Slip Opinion, No. 74–1365 (D.C. Cir., October 21, 1976).

and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended § 1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under § 1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§ 1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended § 1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

PATENT APPEALS

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral arguments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that § 1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.[14] Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearng is held.

In appeals where the appellant has requested an oral hearing, § 1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.[15] It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the examiner to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing § 1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, § 1.194(c) reflects the present practice of limiting oral argument on behalf of the appellant to twenty minues.[16] The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed § 1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing § 1.196(b) will not be modified, but a new § 1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§ 1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new § 1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in approprite circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

REASONS FOR ALLOWANCE

New § 1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the ex-

[14] See notice of March 20, 1975, 933 O.G. 1010.
[15] MPEP, § 1209.
[16] See notice of March 20, 1975, 933 O.G. 1010.

aminer and is only to be used when the record does not otherwise reveal the reasons for allowance.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§ 1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive; when an examiner allows a claim on the first Office action after citing very close prior art; and when the examiner allows a claim after remand from the Board of Appeals (see new § 1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rules does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal.

TEXT OF RULES ADOPTED

After consideration of the comments received and pursuant to the authority contained in § 6 of Title 35 of the United States Code. Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below.

1. Section 1.11 is revised to read as follows:

§ 1.11 *Files open to the public.*

(a) After a patent has been issued, the specification, drawings, and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be ►obtained◄ [furnished] upon paying the fee therefor. ►After an award of priority by the Board of Patent Interferences as to all parties, the file of any interference which involved a patent, or an application on which a patent has issued.◄ [The file of any terminated interference involving a patent, or an application on which a patent has subsequently issued.] is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

(b) ►All reissue applications and all applications◄ [Applications] in which the Office has accepted a request filed under § 1.139 ►,and related papers in the application file,◄ are open to inspection by the general public, and copies may be ►obtained◄ [furnished] upon paying the fee therefor. ►The filing of reissue applications will be announced in the OFFICIAL GAZETTE. The announcement shall include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned.◄

2. In § 1.14 paragraphs (b) and (d) are revised to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

* * * * *

(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent ►, or in an application which is open to inspection pursuant to § 1.139,◄ is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Abandoned applications may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * *

(d) ►Any decision of the Board of Appeals or the Board of Patent Interferences, or any decision of the Commissioner on petition,◄ [Selected decisions of the Board of Appeals, or of the Commissioner, in abandoned applications] not otherwise open to public inspection ►shall◄ [(paragraph (b) of this section) may] be published or made available for ►public inspection if: (1) The Commissioner believes the decision involves an interpretation of patent laws or regulations that would be of important precedent value; and (2) the applicant, or any party involved in the interference, does not, within two months after being notified of the intention to make the decision public, object in writing on the ground that the decision discloses a trade secret or other confidential information. If a decision discloses such information, the applicant or party shall identify the deletions in the text of the decision considered necessary to protect the information. If it is considered the entire decision must be withheld from the public to protect such information, the applicant or party must explain why. Applicants or parties will be given time, not less than twenty days, to request reconsideration and seek court review before any portions of decisions are made public over their objection.◄ [publication at the Commissioner's discretion, unless the applicant timely presents sufficient reasons for not doing so. The applicant will be notified, through the attorney of record in the application file, when it is proposed to release such a decision and a time not less than thirty days set for presenting any such reasons. The fact that the subject matter of the application has not been made public in any manner, or that the same subject matter is being prosecuted in a pending application, will be considered sufficient reason for not releasing the decision if the applicant so requests unless the text of the decision contains no description of such subject matter. Other reasons presented will be duly considered.] See § 2.27 for trademark applications.

3. Section 1.51 is revised to read as follows:

§ 1.51 *General requisites of an application.*

►(a)◄ Applications for patents must be made to the Commissioner of Patents and Trademarks. A complete application comprises:

►(1)◄ [(a)] A specification, including a claim or claims, see §§ 1.71 to 1.77.

►(2)◄ [(b)] An oath or declaration, see §§ 1.65 to 1.68.

►(3)◄ [(c)] Drawings, when necessary, see §§ 1.81 to 1.88.

►(4)◄ [(c)] The prescribed filing fee. (See 35 USC section 41 for filing fees.)

►(b) Applicants are encouraged to file a prior art statement at the time of filing the application or within three months thereafter. See §§ 1.97 through 1.99.◄

4. In § 1.52 paragraph (a) is revised to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The specification and oath or declaration must be in the English language ►except as provided in § 1.69◄. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written or printed in permanent ink or its equivalent in quality. All of the application paper must be presented in a form having sufficient clarity and contrast between the paper and the writing or printing thereon to permit the production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

* * * * *

5. Section 1.56 is revised to read as follows:

§ 1.56 ►*Duty of disclosure; striking of*◄ [*Improper*] *applications.*

►(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the inventor, on each attorney or agent who prepares or prosecutes the application, and on every other individual who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they are aware of which is material to the examination of the application. Such information is material where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent. The duty is commensurate with the degree of involvement in the preparation or prosecution of the application.◄

►(b) Disclosures pursuant to this section may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.◄

►(c)◄ Any application [signed or sworn to in blank, or without actual inspection by the applicant, and any application altered or partly filled in after being signed or sworn to, and also any application fraudulently filed or in connection with which any fraud is practiced or attempted on the Patent and Trademark Office,] may be stricken from the files ►if:

(1) Signed or sworn to in blank, or without actual inspection by the applicant; or

(2) Altered or partly filled in after being signed or sworn to◄.

►(d) An application shall be stricken from the files if it is established by clear and convincing evidence that any fraud was practiced or attempted on the Office in connection with it or that there was any violation of the duty of disclosure through bad faith or gross negligence.◄

6. In the heading preceding § 1.65 "STATEMENT;" is deleted.

7. In § 1.65 the heading and paragraph (a) are revised to read as follows:

§ 1.65 ►*Oath or declaration.*◄ [*Statement of applicant.*]

(a)(1) The applicant, if the inventor, must state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his application. In every original application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to his application or patented or described in any printed publication in any country before his invention or more than one year prior to his application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in this country. ►He must acknowledge a duty to disclose information he is aware of which is material to the examination of the application.◄ He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the application in this country.

(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68. See § 1.153 for design cases and § 1.162 for plant cases.

* * * * *

8. Section 1.69 is added to read as follows:

►§ 1.69 *Foreign language oaths and declarations.*◄

►(a) Whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand and shall state that such individual understands the content of any documents to which the oath or declaration relates.◄

►(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under § 1.65, the translation may be filed in the Office no later than two months after the filing date.◄

9. The heading "PRIOR ART STATEMENT" is added following § 1.95 and preceding § 1.97.

10. Section 1.97 is added to read as follows:

►§ 1.97 *Filing of prior art statement.*◄

►(a) As a means of complying with the duty of disclosure set forth in § 1.56, applicants are encouraged to file a prior art statement at the time of filing the application or within three months thereafter. The statement may either be separate from the specification or may be incorporated therein.◄

►(b) The statement shall serve as a representation that the prior art listed therein includes, in the opinion of the person filing it, the closest prior art of which that person is aware; the statement shall not be construed as a representation that a search has been made or that no better art exists.◄

11. Section 1.98 is added to read as follows:

►§ 1.98 *Content of prior art statement.*◄

►(a) Any statement filed under § 1.97 or § 1.99 shall include: (1) a listing of patents, publications or other information and (2) a concise explanation of the relevance of each listed item. The statement shall be accompanied by a copy of each listed patent or publication or other item of information in written form or of at least the portions thereof considered by the person filing the statement to be pertinent.◄

►(b) When two or more patents or publications considered material are substantially identical, a copy of a representative one may be included in the statement and others merely listed. A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant.◄

12. Section 1.99 is added to read as follows:

►§ 1.99 *Updating of prior art statement.*◄

►If prior to issuance of a patent an applicant, pursuant to his duty of disclosure under § 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements of § 1.98.◄

13. Section 1.109 is added to read as follows:

►§ 1.109 *Reasons for allowance.*◄

►If the examiner believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning. This shall be incorporated into an Office action rejecting other claims of the application or be the subject of a sepa-

rate communication to the applicant. The applicant may file a statement commenting on the reasons for allowance within such time as may be specified by the examiner. Failure to file such a statement shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner.◄

14. In § 1.175 paragraph (a) is revised to read as follows:

§ 1.175 *Reissue oath or declaration.*

(a) Applicants for reissue, in addition to complying with the requirements of the first sentence of § 1.65, must also file with their applications a statement under oath or declaration as follows:

(1) ►When the◄ [That] applicant verily believes the original patent to be wholly or partly inoperative or invalid, ►stating such belief◄ and the reasons why.

(2) When it is claimed that such patent is so inoperative or invalid "by reason of a defective specification or drawing," particularly specifying such defect.

(3) When it is claimed that such patent is inoperative or invalid "by reason of the patentee claiming more or less than he had a right to claim in the patent," distinctly specifying the excess or insufficiency in the claims.

►(4) When the applicant is aware of prior art or other information relevant to patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.◄

►(5)◄ [(4)] Particularly specifying the errors ►or what might be deemed to be errors◄ relied upon, and how they arose or occurred.

►(6) Stating that ◄ [(5) That] said errors ►, if any,◄ arose "without any deceptive intention" on the part of the applicant.

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15. Section 1.176 is revised to read as follows:

§ 1.176 *Examination of reissue.*

An original claim, if re-presented in the reissue application, is subject to reexamination, and the entire application will be examined in the same manner as original applications, subject to the rules relating thereto, excepting that division will not be required. Applications for reissue will be acted on by the examiner in advance of other applications ►, but not sooner than two months after announcement of the filing of the reissue application has appeared in the OFFICIAL GAZETTE◄.

16. Section 1.194 is revised to read as follows:

§ 1.194 ►*Oral*◄ *Hearing.*

►(a) An oral hearing should be requested only in those circumstances in which the appellant considers such a hearing necessary or desirable for a proper presentation of his appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Appeals as appeals decided after oral hearing.◄

►(b) If appellant requests an oral hearing, an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.◄

►(c)◄ If no request for oral hearing has been made by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing, a day of hearing will be set, and due notice thereof given to the appellant ►and to the primary examiner◄. Hearing will be held as stated in the notice, and oral argument will be limited to [one-half hour] ►twenty minutes for the appellant and fifteen minutes for the primary examiner◄ unless otherwise ordered before the hearing begins.

17. Section 1.196 is amended by adding new paragraph (d) to read as follows:

§ 1.196 *Decision by the Board of Appeals.*

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►(d) Although the Board of Appeals normally will confine its decision to a review of rejections made by the primary examiner, should it have knowledge of any grounds for rejecting any allowed claim that it believes should be considered, it may include in its decision a statement to that effect and remand the case to the primary examiner for consideration thereof. In such event, the Board shall set a period, not less than one month, within which the applicant may submit to the primary examiner an appropriate amendment, or a showing of facts or reasons, or both, in order to avoid the grounds set forth in the statement of the Board of Appeals. If the primary examiner rejects the previously allowed claim or claims on the basis of such statement, the applicant may appeal to the Board of Appeals from the rejection. Whenever a decision of the Board of Appeals includes a remand, that decision shall not be considered as a final decision in the case, but the Board of Appeals shall, upon conclusion of the proceedings before the primary examiner on remand, either adopt its decision as final or render a new decision on all of the claims on appeal, as it may deem appropriate.◄

18. Section 1.291 is revised to read as follows:

§ 1.291 *Protests* ►*and prior art citations by public.*◄ [*to the grant of a patent.*]

►(a)◄ [The patent statutes do not provide for opposition to the grant of a patent on the part of the public. Protests to the grant of a patent are ordinarily merely acknowledged, and filed after being] ►Protests against pending applications will be acknowledged and◄ referred to the examiner having charge of the subject matter involved [for his information]. ►A protest specifically identifying the application to which the protest is directed will be entered in the application file and, if timely submitted and accompanied by a copy of each prior art document relied upon, will be considered by the examiner.◄

►(b) Citations of prior art and any papers related thereto may be entered in the patent file after a patent has been granted, at the request of a member of the public or the patentee. Such citations and papers will be entered without comment by the Patent and Trademark Office.◄

►(c) Protests and prior art citations by the public and any accompanying papers should either (1) reflect that a copy of the same has been served upon the applicant or patentee or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible.◄

19. In § 1.292 paragraph (b) is revised to read as follows:

§ 1.292 *Public use proceedings.*

• • • • •

(b) The petition and accompanying papers should [be filed in duplicate, or served upon the applicant, his attorney or agent of record, and petitioner should offer to bear any expense to which the Office may be put in connection with the proceeding] ►either (1) reflect that a copy of the same has been served upon the applicant, or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible. The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file.◄

20. Section 1.346 is revised to read as follows:

§ 1.346 *Signature and certificate of attorney.*

Every paper filed by an attorney or agent representing an applicant or party to a proceeding in the Patent and Trademark Office must bear the signature of such attorney or agent, except papers which are required to be signed by the applicant or party in person (such as the application itself and affidavits or declarations required of applicants). The signature of an attorney or agent to a paper filed by him, or the filing or presentation of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief, there is good ground to support it ►, including any allegations of improper conduct contained therein◄; and that it is not interposed for delay.

Effective Date. These amendments become effective on March 1, 1977, except for §§ 1.51, 1.97, 1.98, and 1.99 which

become effective on July 1, 1977, and §§ 1.65 and 1.69 which become effective on January 1, 1978.

Date: Jan. 18, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH.D.
Assistant Secretary for Science and Technology.
Date: Jan. 19, 1977.

NOTE.—The above notice is identical to a notice that was published in the Federal Register of January 28, 1977 (42 F.R. 5588) except that the above notice shows the differences between the existing rules and the rules being adopted. Additions are indicated by arrows and deletions are indicated by brackets.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,777,926, M. E. Bourns, VARIABLE RESISTOR, **filed** May 21, 1974, D.C.N.J. (Newark) Doc. C–74–745, *Bourns, Inc. and Marian E. Bourns* v. *Mepco, Inc.* Stipulation of dismissal of action, Apr. 30, 1976.

2,873,440, J. B. Speller, ANALOGUE-TO-DIGITAL CONVERTER, **filed** Oct. 4, 1976, United States Court of Claims (District of Columbia) Doc. 13–76, *United Technologies Corporation* v. *The United States.* Judgment entered for plaintiff against the United States, Oct. 8, 1976.

2,990,025, Talbert and Scarborough, BIT, **filed** July 1, 1974, D.C., S.D. Tex. (Houston) Doc. CA74–890, *Dresser Industries, Inc.* v. *Smith International, Inc.* The complaint in its entirety is dismissed with prejudice, Mar. 31, 1976.

3,029,109, W. P. Nail, CONTROL OF INFLATABLE ARTICLES, **filed** May 27, 1976, D.C., N.D. Calif. (San Francisco) Doc. C76–1084–SC, *World Products Warehouse Company* v. *Keith W. Reid, Donald Johnson and Air Beds Inc.*

3,048,581, J. Fried, ACETALS AND KETALS OF 16,17-DIHYDROXY STEROIDS, **filed** Mar. 26, 1976, D.C.N.J. (Newark) Doc. C–76–560, *Premo Pharmaceutical Laboratories, Inc.* v. *E. R. Squibb & Sons, Inc.*

3,056,836, H. D. Moed, ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, **filed** Sept. 27, 1976, D.C., W.D. Ky. (Bowling Green) Doc. C76–0072(B), *Mead Johnson & Company and U.S. Philips Corporation* v. *Richie Pharmacal Company, Inc.*

3,104,799, D. J. Steidinger, ENVELOPE ASSEMBLY, **filed** Apr. 21, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c1501, *Uarco Inc.* v. *The Standard Register Company.*

3,122,238, F. F. Brunette, DISPLAY ASSEMBLIES, **filed** Oct. 7, 1976, D.C., W.D. Mich. (Grand Rapids) Doc. K76–503 C.A. 9, *Frederick F. Brunette and Brilliant Products Inc.* v. *Union Steel Products.*

3,134,732, Kearby, Thorn and Hinlicky, REACTIVATION OF REGENERATED NOBLE METAL CATALYSTS WITH GASEOUS HALOGENS, **filed** June 4, 1976, D.C., S.D. Tex. (Houston) Doc. CA–76–H–934, *Exxon Research & Engineering Co.* v. *Atlantic Richfield Co. and Engelhard Minerals & Chemical Corp.*

3,146,972, E. Engel, EMERGENCY CONTROL SYSTEM FOR AIRCRAFT, **filed** Aug. 30, 1976, D.C., S.D.N.Y., Doc. 76–C–3869, *Ervin Engel* v. *National Aeronautics and Space Administration.*

3,173,583, E. A. Wahl, BIN ACTIVATOR, **filed** July 23, 1976, D.C.N.J. (Newark) Doc. 76–1412, *Eugene A. Wahl and Vibra Screw Incorporated* v. *Solids Flow Control Corporation.*

3,259,291, J. A. Maurer, MOTION PICTURE PROJECTOR WITH AUTOMATIC EDGEWISE FILM THREADING, **filed** May 6, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c1698, *The Singer Company and McGraw-Hill, Inc.* v. *Bell & Howell Company.*

3,265,219, A. E. Sundin, CRANE WITH FOLDING BOOM WHICH PASSES CLOSE TO BUT CLEARS ITS MAST, **filed** Mar. 19, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–521A, *Hiab-Foco AB* v. *Wm. and Harvey Rowland of Georgia, Inc. et al.*

3,495,668, P. W. Schumacher, DRILL BIT, **filed** Oct. 18, 1976, D.C., S.D. Tex. (Houston) Doc. 76–H–1703, *Reed Tool Company* v. *Dresser Industries, Inc.*

3,650,766, Y. Smader, EXTRUDED FOOD PRODUCTS AND METHOD OF PRODUCING SAME, **filed** Oct. 14, 1976, D.C., N.D. Ohio (Toledo) Doc. C76–521, *DCA Food Industries Inc.* v. *Fry Foods, Inc.* Same, **filed** Oct. 14, 1976, D.C., N.D. Tex. (Dallas) Doc. CA3–76–1364–C, *DCA Food Industries* v. *Rubenstein Foods, Inc.* Same, **filed** Oct. 14, 1976, D.C. Md. (Baltimore) Doc. K–76–1543, *DCA Food Industries, Inc.* v. *Old Salt Seafood Co., Inc.*

3,669,499, Semplonius and Kolk, CHAIR, **filed** July 25, 1976, D.C. Del. (Wilmington) Doc. 76–278, *Steelcase, Inc.* v. *Harvard Industries, Inc.* Stipulation and order dismissing this action, Oct. 4, 1976.

3,750,187, R. D. Keefer, RECORDING AND INTEGRATOR UNIT, **filed** Oct. 29, 1974, D.C., E.D. Mich. (Detroit) Doc. 74–72690, *Gelman Instrument Company* v. *Transidyne General Corporation.* Consent judgment, in view of an agreement whereby plaintiff has granted defendant a non-exclusive license under said patent, the claims presented by plaintiff and the counterclaims presented by defendant in this suit are all dismissed with prejudice, Oct. 7, 1976.

3,766,460, Hentz and Burroughs, MANUAL CONTROL SYSTEM FOR NUMERICALLY CONTROLLED MACHINE, **filed** Oct. 18, 1976, D.C.N.J. (Newark) Doc. 76–1992, *LeBlond Incorporated* v. *H. Ernault-Somua, S.A.*

3,785,050, Whitledge and Kavick, COUPLING ATTACHMENT DEVICE; **3,858,298**, same, SWAGING APPARATUS, **filed** Oct. 4, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–1646A, *Samuel Moore & Company* v. *Parker Hannifin Corporation and The Orton Company.*

3,858,298. (See 3,785,050.)

3,892,427, Kraynak and Blumenfield, PERSONALIZED COMPUTER PRINTED HARD COVERED BOOK, **filed** Dec. 31, 1975, D.C., C.D. Calif. (Los Angeles) Doc. CV–75–4343–R, *Me-Books Publishing C., Inc.* v. *Spencer Gifts, Inc.*

3,908,199, C. Lim, FAN HAT APPARATUS, **filed** Oct. 18, 1976, D. C. Hawaii (Honolulu), Doc. CV–76–0383, *Chai-Kil Lim* v. *Kory Tyau.*

3,912,696, J. I. Doughty, CURABLE PLASTIC COMPOSITION, **filed** Apr. 13, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–1194–FW, *Minnesota Mining and Manufacturing Company* v. *Products Research & Chemical Corporation.*

Re. 25,570, J. H. Lemelson, EXTRUSION APPARATUS, **filed** Aug. 12, 1976, D.C.N.J. (Newark) Doc. 76–1583, *Jerome H. Lemelson* v. *Kautex-Werke Reinold Hagen GmbH and Kautex Machines Inc.*

PATENT NOTICES

Certificates of Correction for the Week of Feb. 22, 1977

Re. 28,884	3,964,845	3,984,526	3,989,726
3,549,427	3,965,270	3,984,544	3,989,732
3,606,125	3,967,378	3,984,553	3,989,821
3,674,573	3,968,420	3,984,726	3,989,860
3,677,832	3,970,436	3,984,866	3,989,961
3,687,969	3,970,441	3,985,015	3,990,798
3,747,760	3,970,685	3,985,117	3,990,881
3,758,496	3,971,783	3,985,271	3,991,099
3,760,424	3,972,763	3,985,505	3,991,160
3,762,002	3,972,890	3,985,521	3,991,253
3,781,276	3,973,063	3,985,652	3,991,280
3,871,885	3,975,013	3,986,275	3,991,421
3,886,148	3,975,165	3,986,657	3,991,570
3,889,795	3,975,479	3,986,693	3,991,652
3,902,889	3,975,607	3,987,027	3,991,747
3,912,681	3,976,946	3,987,102	3,991,771
3,916,246	3,977,031	3,987,130	3,992,167
3,919,382	3,978,282	3,987,151	3,992,323
3,919,656	3,978,437	3,987,405	3,992,463
3,920,067	3,978,699	3,987,418	3,992,535
3,924,701	3,978,708	3,987,427	3,992,669
3,924,858	3,978,827	3,987,548	3,992,775
3,925,479	3,980,192	3,987,756	3,992,853
3,926,705	3,980,331	3,987,841	3,992,962
3,926,906	3,980,655	3,987,963	3,993,001
3,928,097	3,980,781	3,988,064	3,993,035
3,934,557	3,981,311	3,988,067	3,993,500
3,934,979	3,981,584	3,988,132	3,993,544
3,936,472	3,981,843	3,988,136	3,993,726
3,937,835	3,982,111	3,988,261	3,993,822
3,941,856	3,982,329	3,988,466	3,994,097
3,942,847	3,982,430	3,988,473	3,994,157
3,947,260	3,982,432	3,988,610	3,994,421
3,947,813	3,982,468	3,988,673	3,994,615
3,951,328	3,982,474	3,988,789	3,994,639
3,953,608	3,982,475	3,988,928	3,995,148
3,954,584	3,982,588	3,989,034	3,995,174
3,955,072	3,982,973	3,989,072	3,995,340
3,956,495	3,983,018	3,989,146	3,995,393
3,957,580	3,983,066	3,989,342	3,995,921
3,959,179	3,983,279	3,989,466	3,996,271
3,959,309	3,983,397	3,989,518	3,996,368
3,961,680	3,983,479	3,989,596	3,997,837
3,962,086	3,983,611	3,989,616	
3,963,498	3,983,952	3,989,617	
3,964,328	3,983,983	3,989,664	

Disclaimer and Dedication

3,677,722.—*Frank Rymas,* Sterling Township, Macomb County, Mich. CEMENTED CARBIDE COMPOSITION AND METHOD OF PREPARATION. Patent dated July 18, 1972. Disclaimer and dedication filed Dec. 13, 1976, by the assignee, *The Walmet Corporation.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Erratum

All reference to Patent Number 4,004,623 to Russell H. Thackery of Columbus, Ohio for Power Tool, appearing in the OFFICIAL GAZETTE of January 25, 1977, should be deleted since no patent was granted.

Disclaimer

3,853,723.—*Robert Mack,* Lake Charles, La. MERCURY CELL ANODE SHORT DETECTION AND CURRENT BALANCING. Patent dated Dec. 10, 1974. Disclaimer filed Dec. 15, 1976, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 15, 16, 17 and 18 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 29, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-17-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-16-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-2-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-20-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-1-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-6-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-23-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-1-76

Expiration of patents: The patents within the range of numbers indicated below expire during February 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,923,008 to 2,926,351, inclusive
Plant Patents..... Numbers 1,901 to 1,918, inclusive

REISSUES

FEBRUARY 22, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

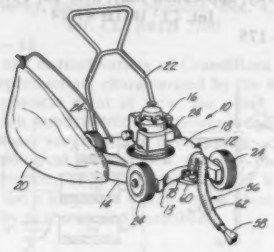
Re. 29,139
LAWN MAINTENANCE EQUIPMENT

Carlton E. Messner, 1445 Randolph, Muskegon, Mich. 49441

Original No. 3,905,181, dated Sept. 16, 1975, Ser. No. 439,385, Feb. 4, 1974. Application for reissue Feb. 2, 1976, Ser. No. 654,031

Int. Cl.² A01D *35/262*

U.S. Cl. 56—13.1 26 Claims



10. Lawn maintenance equipment comprising a housing having a front wall, a rear wall and a top wall, sidewalls, a bottom inlet for air and vegetation and a discharge chute disposed in the upper part of one of said walls, a power driven, generally vertically disposed shaft within said housing, a cutting blade mounted to said shaft in a horizontal plane disposed below said discharge chute, a fan blade fixed to said shaft above said cutting blade to rotate at the same speed as said cutting blade, a baffle mounted to said housing and extending from said front wall generally horizontally between said cutting blade and said fan blade, said baffle being adapted to effect an increase in the rate of air flow and to direct said air flow toroidally in said housing.

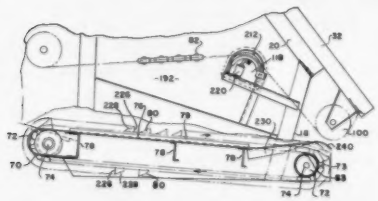
Re. 29,140
HAY ROLL FORMING MACHINE

Aquila D. Mast, Lancaster, and Edward T. Eggers, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Original No. 3,815,345, dated June 11, 1974, Ser. No. 353,947, Apr. 24, 1973. Application for reissue June 7, 1976, Ser. No. 693,826

Int. Cl.² A01D *39/00*

U.S. Cl. 56—341 13 Claims



8. A mobile hay roll forming machine adapted to engage a swath or windrow of forage crop material lying upon a field and coil it into a compact roll of substantial length and diameter, said machine comrising a mobile frame, vertical side members on said frame spaced transversely apart to define a roll-forming cavity therebetween, an endless flexible upper apron in the upper portion of said cavity, supporting means on said frame for said upper apron arranged and adapted to position a portion thereof as a lower course and another portion as an upper course, said lower course of said upper apron being engageable with said swath or crop material as the same is coiled into a roll, and means operable to drive said upper apron in a manner to move said lower course thereof in a direction to facilitate coiling of said roll, and yieldable means supported by said frame and engaging and supporting a portion of said upper apron initially in a contracted arrangement and operable to permit said lower course of said apron to expand toward said upper course thereof as a roll of crop material being formed within said cavity increases in diameter; in combination with auxiliary guide means supported upon said side members at a predetermined level above a field over which the machine is moving to provide a lower portion of said roll-forming cavity with a height substantially less than the diameter of a roll of crop material of ultimate maximum size to be formed in said machine and within which said formation is initiated, said auxiliary guide means comprising guide members having upper portions and said members being supported by said side members on said frame for movement of said upper portions thereof between a position in which said upper portions project into said cavity and respectively engage the opposite side edges of said lower course of said upper apron for supporting the same and to define the height of said lower portion of said cavity within which the formation of said roll is initiated and a position in which said upper portions of said guide members are retracted from said projected positions toward said side members once formation of said roll has been initiated in said lower portion of said cavity.

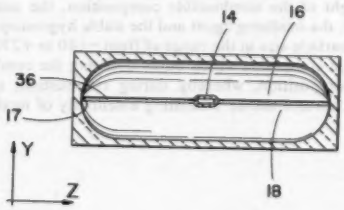
Re. 29,141
APPARATUS FOR ORIENTING GENERALLY FLAT PARTICLES FOR SENSING

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Original No. 3,893,766, dated July 8, 1975, Ser. No. 369,910, June 14, 1973. Application for reissue Dec. 3, 1975, Ser. No. 637,232

Int. Cl.² G01N *1/28*

U.S. Cl. 356—36 17 Claims



1. A flow chamber for orienting sample particles suspended in a sample fluid for [observation by slit-scan photometry] *sensing by interaction with light* said flow chamber having an entrance for receiving the sample fluid and an exit for fluid discharge, said flow chamber being configured so that the ratio of a first dimension of the flow chamber to a second dimension of the flow chamber is monotonically increasing in the direction of sample fluid flow, the first dimension being transverse to the second dimension, and the cross-sectional area of said flow chamber generally normal to the direction of fluid flow is configured to decrease gradually and monotonically in the direction of fluid flow such that fluid flow within said flow chamber is caused to accelerate gradually and mono-

tonically and [observation means for transmitting a light beam through said flow chamber located] *means for producing said light in said flow chamber* at a point prior to said exit.

Re. 29,142

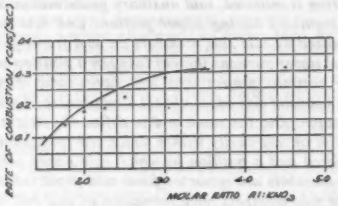
COMBUSTIBLE COMPOSITIONS FOR GENERATING AEROSOLS, PARTICULARLY SUITABLE FOR CLOUD MODIFICATION AND WEATHER CONTROL AND AEROSOLIZATION PROCESS

Henry M. Papee; Alberto C. Montefinale; Gianna L. Petriconi, all of Rome, Italy, and Tadeusz W. Zawidzky, Ottawa, Canada, assignors to Consiglio Nazionale delle Richerche, Rome, Italy

Original No. 3,630,950, dated Dec. 28, 1971, Ser. No. 777,581, Nov. 21, 1968. Continuation-in-part of Ser. No. 742,956, June 19, 1968, abandoned, which is a continuation of Ser. No. 444,923, March 22, 1965, abandoned, which is a continuation-in-part of Ser. No. 392,809, Aug. 28, 1964, abandoned. Application for reissue May 22, 1973, Ser. No. 362,680

Int. Cl.[2] A01G *15/00;* **C09K** *3/30;* **E01H** *13/00*

U.S. Cl. 252—305 **11 Claims**



1. A combustible composition consisting of a readily oxidizable substance selected from the group consisting of aluminum, magnesium, alkali-metals and alkaline earth metals; an oxidizing agent selected from the groups consisting of:

(a) sulphur and sulphur yielding compounds; and

(b) organic and inorganic nitrates, alkali-metal and ammonium chlorates and perchlorates;

the molar ratio of the oxidizable substance to the oxidizing agent being between 1.5:1 and 3.5:1 and a stable hygroscopic solid to be dispersed which does not directly participate in the combustion process of the combustible composition, said hygroscopic solid being present in an amount up to 40% of the total weight of the combustible composition, the oxidizable substance, the oxidizing agent and the stable hygroscopic solid having a particle size in the range of from −140 to +270 mesh, and a fused compound which burns initiating the combustion of said composition, whereby during combustion, a finely dispersed aerosol smoke consisting essentially of moderately hygroscopic condensation giant nuclei and a non-hygroscopic gas are simultaneously evolved, said gas acting to disperse said nuclei, thereby generating aerosol smoke and a non-hygroscopic gas which control and modify weather conditions.

Re. 29,143

FAIL-SAFE APPARATUS FOR CHECKING THE PRESENCE OF FLAME IN A BURNER

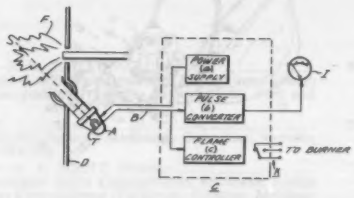
Gianni Bianchini, Reggio Emilia, Italy, assignor to Societa Italiana Elettronica S.p.A., Milan, Italy

Original No. 3,914,662, dated Oct. 21, 1975, Ser. No. 462,190, Apr. 18, 1974. Application for reissue Dec. 4, 1975, Ser. No. 637,583

Claims priority, application Italy, May 22, 1973, 24389/73

Int. Cl.[2] H01H *47/24*

U.S. Cl. 361—175 **13 Claims**



1. A flame control device usable with a detector head exposed to the radiation of a flame to be monitored, said detector head preferably comprising an ionization tube which develops an output signal in the presence of flame, said flame control device comprising:

a chain of stages being connected in cascade fashion, each stage including at least one electrical component;

a first stage of said chain being coupled to said detector head;

a first one of all remaining stages including dynamic coupling means to stop the continuous components and to translate only energy given by the alternate components of the input signal;

a second one of said remaining stages including energy storage means for storing energy furnished by said coupling means and generating an electrical signal representative of the signal developed by said detector head;

a third one of said remaining stages including first chopper means for sampling said electrical signal;

a fourth one of said remaining stages including a threshold circuit measuring the level of the sampled signal, for developing an output signal having a first level in the presence of a flame and for developing an output signal of a second level within a predetermined period after the absence of flame.

PLANT PATENTS

GRANTED FEBRUARY 22, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,017

ROSE PLANT-PITICA VARIETY

Rene Royon, Mougins, France, assignor to Universal Plants S. A. R. L., France

Filed Nov. 20, 1975, Ser. No. 633,952
Claims priority, application Morocco, Dec. 4, 1974, 16979
Int. Cl.[2] A01H 5/00
U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of Grandiflora rose plant, of vegetative reproduction, characterized by the fact that:

from the physical point of view, the plant, with medium green adult wood, is erect, the flower is double, pale pink, its petals are very firm and overlapping;

from the biological point of view, this rose plant is of vigorous vegetation, its re-blooming capacity is excellent, its flowers last a long time either on the plant or when cut;

substantially as shown and described.

4,018

ROSE PLANT

Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Jan. 15, 1976, Ser. No. 649,505
Int. Cl.[2] A01H 5/00
U.S. Cl. Plt.—27 1 Claim

1. A new and distinct cultivar of rose of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its uniform shape; upright and heavily branched plant habit; large, leathery, mildew resistant foliage; abundant flowers of Blood Red (W) color.

PLANT PATENTS

GRANTED FEBRUARY 22, 1977

PATENTS

GRANTED FEBRUARY 22, 1977

ERRATA

For CLASS	See PATENT NO.
081–003	4,008,632
081–068	4,008,636
320–015	4,009,051
429–191	4,009,052
429–094	4,009,053
429–112	4,009,055
429–126	4,009,056
358–083	4,009,330
358–127	4,009,331
358–280	4,009,332
358–213	4,009,333
358–167	4,009,334
358–240	4,009,335
179–015 BY	4,009,336
179–018 ES	4,009,337
200–336	4,009,363
235–064	4,009,370
361–038	4,009,417
361–038	4,009,418
361–091	4,009,419
361–088	4,009,420
361–119	4,009,421
361–120	4,009,422
361–385	4,009,423
361–433	4,009,424
361–433	4,009,425
200–014 BA	4,009,458
324–156	4,009,477

PATENTS

GRANTED FEBRUARY 22, 1977

ERRATA

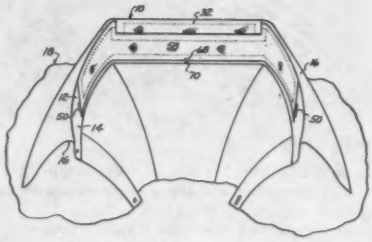
PATENTS

GRANTED FEBRUARY 22, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

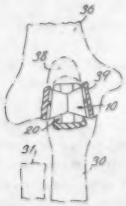
GENERAL AND MECHANICAL

4,008,494
GARMENT COLLAR PROTECTOR
Clarence W. Hicks, 12835 La Salle, Detroit, Mich. 48238
Filed Aug. 1, 1975, Ser. No. 600,945
Int. Cl.² A41D *27/16*
U.S. Cl. 2—60 **3 Claims**



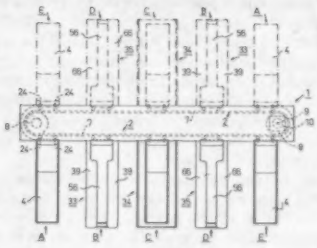
1. A garment collar protector comprising
an elongated base strip of flexible material having a forward side and a rearward side and a central portion,
said rearward side having thereon pressure-sensitive adhesive means adapted to detachably secure said base strip to the inner side of the garment collar near the upper edge thereof,
an elongated collar protector strip of flexible moisture-absorbed material secured to said base strip adjacent its upper edge and extending along its central portion,
and an elongated facing strip of flexible material secured to the forward side of said base strip,
said protector strip being reversely bent into elongated forward and rearward portions secured respectively to said forward and rearward sides of said base strip.

4,008,495
PROSTHETIC BONE JOINT DEVICES
Michael Edward Cavendish, Rainford, and Martin Arthur Elloy, Liverpool, both of England, assignors to National Research Development Corporation, London, England
Filed June 26, 1975, Ser. No. 590,823
Claims priority, application United Kingdom, July 3, 1974, 29483/74
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **9 Claims**



1. An endoprosthetic elbow joint device comprising:
a humeral component having a bearing surface defined by a surface of revolution about a longitudinal axis through said component, which surface is circumferentially convex but has a concave longitudinal shape converging in like manner from the opposite ends of the central region thereof, and having two fixation surfaces respectively located at said ends, which fixation surfaces are inclined in a like and mutually convergent manner in a transverse direction relative to said axis, are each wholly bounded within a space defined by continued longitudinal projection of said bearing surface, and are each formed with a relieved configuration; and
an ulnar component having a bearing surface generally complementary with, and in articulatory bearing engagement with, but of lesser circumferential extent than, said humeral bearing surface, and having a fixation surface located remotely from said ulnar bearing surface and formed with a relieved configuration.

4,008,496
AUTOMATED BATHING PLANT
Hans Arne Valentin Johansson, Treharadsvagen 36, S-241 00 Eslov, Sweden
Filed Aug. 4, 1975, Ser. No. 601,274
Claims priority, application Sweden, Aug. 7, 1974, 7410097
Int. Cl.² A47K *3/22*; A61G *7/08*; B65G *17/14*, *17/20*
U.S. Cl. 4—145 **36 Claims**



1. An automated bathing plant, comprising:
a supporting frame;
a plurality of spaced stations arranged in a line on said supporting frame, and including an initial station, a final station, and at least one treatment station between said initial and said final stations;
conveyor means mounted above said spaced stations on said supporting frame, and including a plurality of spaced, depending carriages, said conveyor means being operable to progressively move said carriages linearly from one station to another, and further including control means effective to operate said conveyor means for moving said carriages and to position said carriages at said stations for a prescribed period of time;
mounting means carried on said depending carriages;
a plurality of horizontally disposed carrier plates each adapted to support a patient lying in a prone position, and each including a head end and a foot end; and
attaching means on the head end of each of said carrier plates engageable with said mounting means carried on said depending carriages for detachably mounting said carrier plates on said carriages to project horizontally from and generally normal to the direction of movement of said carriages, said carriages being spaced apart a distance sufficient to provide access by attendants to both sides of said carrier plates.

4,008,497

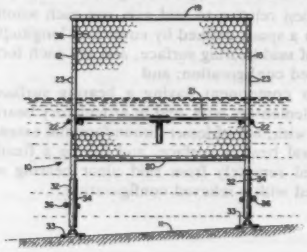
SWIMMING POOL PLAY PEN

Kenneth E. Badon, 1318 Ryan St., Lake Charles, La. 70601

Division of Ser. No. 387,969, Aug. 13, 1973, Pat. No. 3,874,005. This application Feb. 21, 1975, Ser. No. 551,590

Int. Cl.² E04H *3/19, 3/16;* **E02B** *17/00*

U.S. Cl. 4—171 **4 Claims**



1. The method of providing a safe play environment for a small child or infant in water of significant depth comprising the following steps:

a. providing a water compatible, relatively lightweight, portable playpen enclosure structure defining an enclosure of substantial size sufficient to allow a small child or infant to freely move around therein, said playpen enclosure structure being provided with members having openings therein which allow water to flow into the enclosure, said playpen enclosure structure including

i. a basic playpen support frame;

ii. rigid playpen platform means supported on said basic support frame for supporting the small child or infant within said enclosure during play in the water;

iii. playpen wall enclosure means carried by said basic support frame around said platform means for restricting the small child or infant to said platform means;

iv. playpen leg support means connected to said basic frame for supporting said basic frame on the water bottom; and

v. variable support means connected within said platform, said basic frame and said leg means for allowing variation of the vertical position of said platform means with respect to the bottom of said leg means by a substantial amount,

b. manually placing said relatively lightweight, portable playpen enclosure structure in the water so that the bottom of said playpen leg support means rests on the water bottom and water flows into the enclosure; and

c. adjusting the vertical level of said playpen platform means by means of said variable support means so that said platform means will be located at least near the surface of the water; whereby a small child or infant placed in the enclosure defined by said playpen enclosure structure can safely play and move around in the water.

4,008,498

TUB PAD

Stephen R. Thomas, 5706 N. Mason, Chicago, Ill. 60646

Filed June 18, 1975, Ser. No. 587,991

Int. Cl.² A61H *9/00, 33/06*

U.S. Cl. 4—180 **7 Claims**

1. A hollow body water fillable assembly including

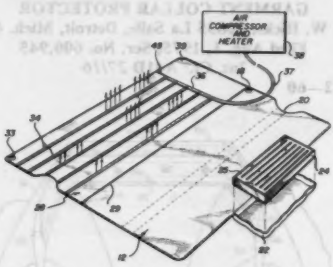
a water fillable pad member dimensioned to be received on a tub bottom to support a bather, said pad having top and bottom side walls sealed along a continuous edge,

a water inlet-outlet valve in the top side wall of the water fillable pad member,

a plurality of air tubes mounted to said top side wall and extending towards the opposite ends of the water fillable pad member, a series of apertures along the length of each tube,

a manifold tube joined to said plurality of air tubes, means to deliver compressed air,

a side air inflatable pad member hinged to the side of said water fillable pad member, said side air inflatable pad member having spaced sidewalls sealed along a continuous edge, and said side pad member having dimensions to



cover the bather when draped over the top of the tub, and means connecting said side pad member with said means to deliver compressed air, and

a connecting tube joining said manifold tube and the compressed air means to deliver air to said plurality of air tubes for discharge through said apertures to create bubbling agitation through tub water.

4,008,499

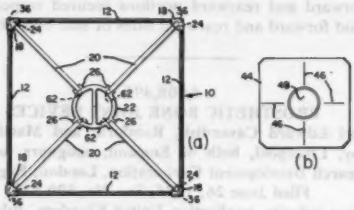
COLLAPSIBLE PLAYPEN

William Arthur Wren, Jr., 736 Ensign Ave., Beachwood, N.J. 08722, and Joseph Paul Gibson, Jr., 52 Sunset Drive, Howell, N.J. 07731

Continuation-in-part of Ser. No. 538,769, Jan. 6, 1975, abandoned. This application Dec. 3, 1975, Ser. No. 637,272

Int. Cl.² A47C *29/00*

U.S. Cl. 5—99 C **10 Claims**



1. In a playpen enclosed by side materials and intended for portable use, the combination therewith of:

a plurality of corner legs, to which the side materials of the playpen are attached;

a plurality of support arms angularly displaced with respect to said corner legs;

a support member situated within the framework structure of said playpen when open; and

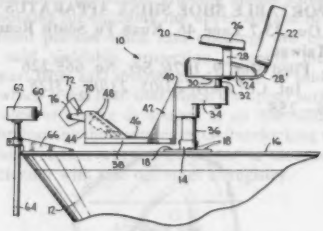
means coupling opposite ends of said support arms to said corner legs and to said support member, respectively, said means being so constructed and arranged that actuation of said support member in one direction correspondingly rotates said support arms and corner legs in an opposite direction so as to collapse said playpen to a construction of cross section substantially similar to that of said support member;

said means being operative in conjunction with said corner legs to prevent the collapse of said playpen unless the angular displacement between each of said support arms and said corner legs is first reduced below a predetermined amount prior to the actuation of said support member.

4,008,500
FISHING BOAT PLATFORM

Clarence Addison Hall, Jr., P.O. Box 676, Belzoni, Miss. 39038

Filed Sept. 2, 1975, Ser. No. 609,824
Int. Cl.² B63B 29/00
U.S. Cl. 9—7 18 Claims

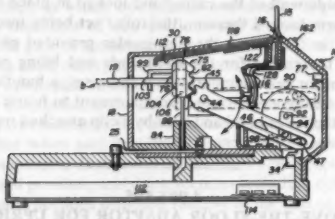


1. A fishing boat platform, which comprises: platform means rotatably mounted with respect to a substantially flat surface of a boat; a chair rotatable with respect to said platform means; and feet placement means positioned near an end of and rotatable with said platform means, said platform means being rotatable about a platform axis that is substantially perpendicular to said flat surface of said boat, said platform means including a base member upon one end of which is mounted said feet placement means, said feet placement means including foot pedal means for controlling an outboard motor.

4,008,501
ELECTRICALLY ACTUATED PUNCHING AND BINDING APPARATUS

James W. Cutter, Los Altos, Calif., assignor to NSC International Corporation, Hot Springs, Ark.

Filed Mar. 12, 1976, Ser. No. 666,339
Int. Cl.² B42C 19/00; B26D 5/08
U.S. Cl. 11—1 AC 14 Claims

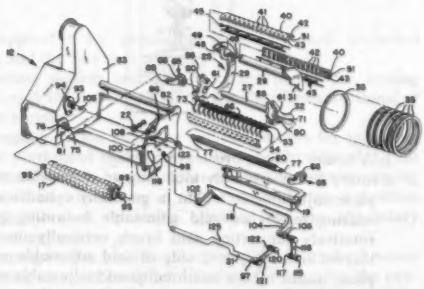


1. Punching and binding apparatus, comprising:
means forming a base;
punching means for punching apertures along an edge of a stack of sheet material;
binding means for inserting the flexible fingers of a comb binder through the punch apertures for binding the sheet material together and including,
an elongated rigid comb plate member having a plurality of comb teeth,
an elongated rigid hook plate having a plurality of hooks corresponding in number to the number of said comb teeth, and
guide means to which said comb plate and said hook plate are mounted, said guide means permitting said comb plate to move in its longitudinal direction between a first position and a second position, said hook plate being mounted adjacent said comb means with its hooks being positioned proximate said comb plate and being movable away from said comb plate, and
actuating means for actuating said punching means and said binding means including,
an actuating shaft,
an electric motor affixed to said base and first means mechanically coupling the armature of said motor to said shaft to impart rotary energy thereto,
second means mechanically coupling said shaft to said punching means;
a first camming means affixed to said hook plate and including a second camming surface,
a first arm carried by and extending radially from said shaft to cammingly engage said first camming surface and move said comb plate,
a second arm carried by and extending radially from said shaft to cammingly engage said second camming surface and move said hook plate,
function selector means having a punch setting and bind setting,
coupling means responsive to said selector means and operative to selectively couple said first and second arms to said shaft when said coupling means is in said bind setting, and
an electronic control module responsive to said selector means and operative to energize said motor, whereby when said selector means is in said punch setting, said motor is caused to actuate said punching means and when said selector means is in said bind setting, said coupling means and motor cause said first arm to move said first camming means which in turn moves said comb plate between said first position and said second position, and further cause said second arm to move said second camming means which in turn moves said hook plate away from and back toward said comb plate.

4,008,502
MEAT GRIPPING AND MOVING CYLINDER AND MOUNT THEREFOR

Herbert R. Crane, Tipp City, and Anthony L. Fullenkamp, Ft. Loramie, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Continuation of Ser. No. 535,041, Dec. 20, 1974, abandoned.
This application May 6, 1976, Ser. No. 683,913
Int. Cl.² A22C 17/08
U.S. Cl. 15—3.17 6 Claims



1. In a meat scraping machine for removing residues of coagulated blood, bone dust, marrow, meat particles, fat, and so on, from a sawed surface of a piece of meat; means for removing such residues; means for operating the residue removing means; and means for bringing the piece of meat into engagement with the residue removing means, including a framework, a plurality of relatively thin, open, annular, blade-like rings, supports for the rings for engaging and holding each

of the rings coaxially in position with respect to one another to define a cylinder, the ring supports being mountable in predetermined positions on the framework to lock the rings irremovably on the framework when all the ring supports are mounted in their predetermined positions, and the rings being rotatable with respect to the ring supports when locked thereon; the improvement comprising:

a. means on the framework for mounting at least one of the ring supports independently on the framework for attachment thereto and removal therefrom independently of any of the rings or the remaining ring supports to provide for removal of said one ring support without removing the rings or the remaining ring supports from the framework, the ring supports again locking the ring irremovably on the framework when said one ring support is remounted in position on the framework, and

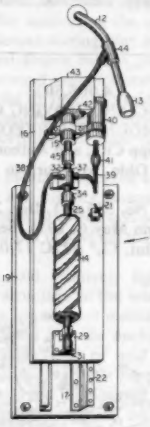
b. the framework also including means forming a part thereof for continuing, when said one ring support has been removed and while the framework remains intact, to support the remaining ring supports in their predetermined positions, and for supporting the rings thereon while releasing the rings and the remaining ring supports and providing for removal thereof from the framework for disassembly and reassembly of the rings and ring supports on the framework while the framework remains intact.

4,008,503

ROTARY SHOWER BRUSH

Marvin E. Tharp, 12629 - 56th St. West, Milan, Ill. 61264

Filed June 1, 1976, Ser. No. 691,503
Int. Cl.² A46B *13/02;* **A61H** *7/00*
U.S. Cl. 15—21 D **2 Claims**



1. A rotary shower brush comprising:

a rotary brush assembly including an adjustable mounting plate adjustable in height, a generally cylindrical brush, bearing means on said adjustable mounting plate for rotatively supporting said brush vertically on the axis thereof near the front side of said adjustable mounting plate, motor means mounted to said adjustable mounting plate and coupled to said brush for rotating said brush about the axis thereof,

a wall plate having on the back side thereof fastening means for readily fastening said wall plate to the wall of a shower by manual application of pressure, an adjustable supporting means having afixed member fastened to the front side of said wall plate and a mating movable member fastened to the back side of said adjustable mounting plate, said adjustable supporting means permitting said adjustable mounting plate to move along a line parallel to the face of said wall plate, said wall plate to be oriented to permit vertical positioning of said adjustable mounting plate on said adjustable supporting means, and stopping means for holding said adjustable mounting plate at a selected height on said adjustable supporting means.

4,008,504

PORTABLE SHOE SHINE APPARATUS

Jan-Chou Ou, 33-7 Lane 46, Kuan Fu South Road, Taipei, China /Taiwan

Filed Mar. 9, 1976, Ser. No. 665,226
Int. Cl.² A47L *23/05, 23/08, 23/28*
U.S. Cl. 15—258 **5 Claims**

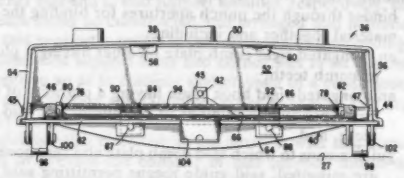
1. Portable shoe shine apparatus comprising a casing having a front opening and a roller set having a base provided with a shaft and slidably mounted on the peripheral surface of said base, a brush, a shoe cream spreader and a buffer disposed 120° apart from each other, the said base having on one end of its shaft an internal spline to receive a splined positioning knob provided in a seat at one side wall of the casing for turning the shaft to set any one of the brush, the shoe cream spreader, or the buffer to project through the front opening, the said positioning knob carrying a slidable holding arm with a locking stud to lock into a plurality of locking cavities disposed about the knob seat to hold the roller set in locked position; the other end of the roller shaft being seated on another side wall of the casing and locked in place by a snap locking arm hinged thereon, the roller set being inserted and confined in the casing through guides provided on the side walls of the casing for the shaft ends and being removable therefrom for replacement with a spare set; a handle integral with the casing and having a compartment to house a tube of cream which is gripped and held by a clip attached on a handle cap for closing the compartment.

4,008,505

ABOVE-THE-FLOOR ADAPTOR FOR UPRIGHT VACUUM CLEANERS

Earl R. Clowers, Anderson, S.C., assignor to The Singer Company, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,999
Int. Cl.² A47L *5/32*
U.S. Cl. 15—338 **6 Claims**



1. An attachment adaptor for an upright vacuum cleaner of the type having a casing enclosing a suction chamber, said

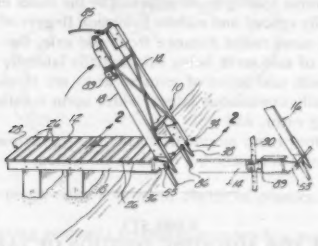
casing including a cantilevered front portion having an under surface formed with an air opening communicating with said suction chamber and an upper surface spaced from said under surface, said attachment adaptor comprising a housing formed with an air chamber having an air opening and a separate hose connection, complemental interlocking means on said housing and on said vacuum cleaner casing adjacent to the openings therein, yieldable projection gripping means formed on said adaptor housing for engaging the upper surface of said cantilevered front portion when said openings are brought into registry, said yieldable projection gripping means being spaced apart from said interlocking means on said adaptor a distance which is less than that which the upper surface of said vacuum cleaner casing is spaced from the under surface thereof for drawing the complemental interlocking means into interlocking relation when the adaptor is mounted on said vacuum cleaner with said openings in registry.

4,008,506

PORTABLE DOCKS AND BRIDGES

Stuart D. Smith, 28430 Swan Drive, Grosse Ile, Mich. 48138

Filed July 30, 1975, Ser. No. 600,435
Int. Cl.² E01D *15/12*
U.S. Cl. 14—71.1 **15 Claims**



1. In a portable dock of sectional construction, the combination of; a pair of elongated dock sections, pivot means interposed between and connected to adjacent ends of said pair of dock sections for relative pivotal movement between a first position in which one of said sections is disposed at an angle to the other of said sections and a second position in which said pair of sections are disposed in longitudinal alignment with each other, said pivot means including a first pivot member connected to one of said sections and a second pivot member connected to the other of said sections, said first and second pivot members being attachable and detachable from each other when said sections are in said first position and being inseparable from each other when said sections are in said second position, said dock sections including complementary support portions disposed radially of the axis of said pivot means and being movable into engagement with each other upon movement of said sections to said second position to support one of said dock sections in cantilevered relationship to the other of said dock sections.

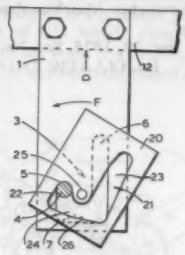
4,008,507

AXLE MOUNTINGS

Joseph Smith, 177A Hobson St., Auckland, New Zealand

Filed Dec. 30, 1975, Ser. No. 645,346
Claims priority, application New Zealand, Oct. 21, 1975, 179002
Int. Cl.² B60B *33/06*
U.S. Cl. 16—34 **4 Claims**

1. An axle mounting comprising a first plate; a second plate pivotally mounted on said first plate; first and second interconnected slot portions being provided in each of said plates; each of said first slot portions being longer than said second slot portions; said slots being so adapted as to accommodate an axle movable therein; the raising and lowering of either end of an article to which said plates are affixed, causing said axle



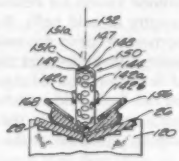
to move between said first and second slot portions; said second plate pivoting about said first plate so as to enable said axle movement to take place.

4,008,508

METHOD AND APPARATUS FOR PROCESSING SHRIMP AND THE LIKE

Robert L. LaPine, Wells, Mich., and Melvin J. Crepeau, St. Petersburg, Fla., assignors to Harry H. Bell & Sons, Inc., St. Petersburg, Fla.

Filed May 19, 1975, Ser. No. 578,740
Int. Cl.² A22C *29/00*
U.S. Cl. 17—52 **46 Claims**



1. Apparatus for processing de-headed and unshelled shrimp and the like comprising;

a cutting station including a cutter means for cutting through the belly of the shrimp to the alimentary canal of the shrimp;

a spreader station including spreader means for spreading the portions of the shrimp on the opposite sides of the cut formed therein by said cutter means and thereby causing the shrimp to assume a substantially flattened position with the shell remaining attached and the alimentary canal exposed;

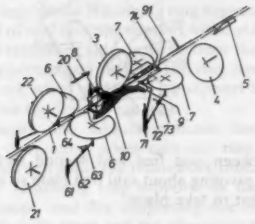
a cleaning station including a rotating cleaning wheel means having an outer peripheral surface for engaging the central portion of the flattened shrimp in the vicinity of the alimentary canal, said peripheral surface including a plurality of circumferentially spaced cavities, each having an edge portion adjoining said peripheral surface, whereby portions of the alimentary canal and/or similar debris can be compressed into said cavities and be pulled away from the shrimp by said cavity edge portions as said cleaning wheel rotates relative to the shrimp; and

conveyor means for moving the shrimp successively through said cutting, spreader and cleaning stations.

4,008,509
MACHINE FOR FILLETING FISH

Horst Braeger, and Gerhard Groth, both of Lubeck, Germany, assignors to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Dec. 29, 1975, Ser. No. 644,522
Int. Cl.² A22C 25/16
U.S. Cl. 17—56 **3 Claims**



1. A filleting machine for producing fillets of fish with the fillets, including the belly flaps, entirely free of pinbones, and in which each fish is conveyed along a path parallel to the main backbone of the fish with its tail leading and belly side down, said machine comprising:

a pair of belly filleting knives arranged to cut the underside of the fish from the root of the tail fin to the trailing end of the belly cavity,

a pair of back filleting knives located along said path downstream of said belly filleting knives and arranged to sever the upper part of the fillet above the vertebral column over the entire length of the fish to provide upper fillet portions,

a pair of upper pinbone knives located along said path downstream of said back filleting knives and arranged to provide a transverse cut above the pinbones of the fish for severing said upper portions from the belly flaps,

a pair of deflectors located along said path downstream of said upper pinbone knives for deflecting said upper fillet portions outwardly of said belly flaps and causing said upper fillet portions to drop downwardly,

a pair of separating knives located along said path downstream of said deflectors and arranged to separate the tail portion of said fish from said vertebral column, with said upper fillet portions adhering to the fish skeleton only at an intermediate bow located at the upstream end of the belly cavity,

hold down means located along said path downstream of said separating knives for pressing down the separated upper fillet portions in the region of the bow below the level of the pinbones of the fish, and

a pair of lower pinbone knives located along said path downstream of said hold down means for cutting beneath the pinbones and above the held down upper fillet portions, thereby separating a narrow strip containing the pinbones from the fillets, and

a pair of rib knives located along said path downstream of said lower pinbone knives and arranged to sever the fillets from the fish skeleton, leaving only said narrow strip containing the pinbones remaining on the skeleton.

4,008,510
FISH SCALER

Gerald A. Laffin, Rte. 1, Aniwa, Wis. 54408

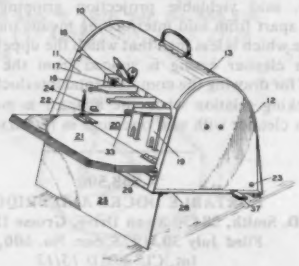
Filed June 23, 1975, Ser. No. 589,787
Int. Cl.² A22C 25/02
U.S. Cl. 17—64 **5 Claims**

1. A fish scaler comprising:

a. a housing having front input opening,

b. a scaling rotor having an axle rotatably journalled in said housing and having a series of adjacently positioned flexible scaling arms attached intermediate their ends to and extending radially from said axle,

c. a pair of laterally spaced extension fingers at one end of each of said arms and a middle extension finger at the other end, said fingers being of less length than said arms, each of said fingers extending in the same general direction as the arm of which it is an integral part and being narrower in width than such arm to provide greater flexibility of said fingers than said arms,



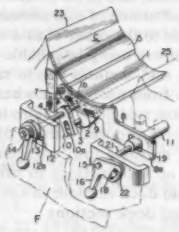
d. transverse scaling teeth attached to the outer ends of the laterally spaced and middle extension fingers of said arms at the same radial distance from said axle, the combined width of said teeth being substantially laterally co-extensive with said series of arms so as to arc through a substantially continuous lateral width upon rotation of said scaling rotor, and

e. a bottom ramp mounted in said housing below said scaling rotor for receiving a fish to be scaled.

4,008,511
DEVICE FOR ADJUSTING POSITION OF TAKER-IN UNDER CASING IN CARD

Shingo Oda, Nagoya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sept. 3, 1975, Ser. No. 610,007
Claims priority, application Japan, Sept. 10, 1974, 49-103509
Int. Cl.² D01G 15/42
U.S. Cl. 19—105 **11 Claims**



1. A carding machine which comprises:

a. a taker-in roller for stripping and feeding a lap;

b. a dish plate and cooperating feed roller positioned on the lap feed side of said taker-in roller;

c. a taker-in under casing below said taker-in roller and on the downstream side of said taker-in roller relative to said dish plate, said under casing comprising a movable half disposed on the upstream side with respect to the movement of the lap, and a stationary half disposed on the downstream side with respect to the movement of the lap;

d. supporting means pivotally supported on said machine and supporting said movable half for turning movement around the pivotal support of said supporting means and

circumferential movement along a portion of the circumference of said taker-in roller;

e. a first adjusting means associated with said movable half for causing said movable half to turn around the pivotal support point of said supporting means; and

f. a second adjusting means associated with said movable half for causing said movable half to move circumferentially along the portion of the circumference of said taker-in roller, said second adjustable means being operable independently of said first adjusting means.

4,008,512

BAND CLAMP OF PLASTICS MATERIAL

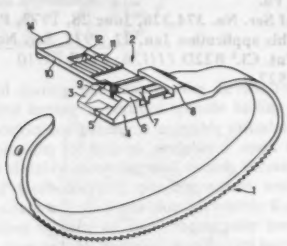
Marcel Prodel, Arnac Pompadour, France, assignor to Societe anonyme dite: Mecanoser S.A., Arnac-Pompadour, France

Filed July 9, 1975, Ser. No. 594,304

Claims priority, application France, July 17, 1974, 74.24885; Mar. 26, 1975, 75.09541

Int. Cl.² B65D *63/00*

U.S. Cl. 24—16 PB **4 Claims**



1. A one-piece releasable band clamp of plastics material comprising:

a strap having generally transversely extending teeth;

a buckle on one end of the strap, a portion of the strap being superimposed on the buckle to form a band;

a flap extending perpendicularly to the length of the strap and attached to said buckle by a flexible portion of reduced cross-section for permitting the flap to be turned back at the portion of reduced cross-section to lie over the superimposed portion of the strap, the flap having teeth which, when the flap has been turned back, extend parallel to and engage the teeth of the superimposed portion of the strap;

and co-operating coupling means on the buckle and the flap, respectively, for locking the flap in its turned-back position and thereby maintaining the engagement of the teeth of the flap and strap, the coupling means comprising a catch projecting from the buckle and means on said flap defining an aperture in a position such that the catch passes through the aperture for locking the flap in its turned-back position.

4,008,513

CLASP

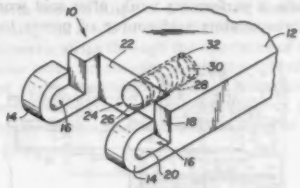
Kenneth F. Griffiths, 31 London Terrace, New Rochelle, N.Y. 10804

Filed Sept. 24, 1975, Ser. No. 616,298

Int. Cl.² A44B *17/00, 13/02*

U.S. Cl. 24—201 A **9 Claims**

1. A clasp comprising a male element, having a main body portion, at least one prong extending axially outwardly from said main body portion, and exposed bar means extending laterally from said at least one prong, and a female element having a main body portion, at least two prongs extending axially outwardly from said main body portion to receive said male portion and extend along the lateral edges of said prongs on said male portion, each of the prongs from said female element having an L-shaped slot formed therein for receiving said bar means of said male element; each of said L-shaped slots comprising a vertical portion extending in a common plane transverse to the axis of said female element and a horizontal portion extending in a common plane axially away from the main body of said female element, and pushing means mounted within the main body portion of one of said male or female elements and normally biased outwardly therefrom for resiliently engaging the main body portion of the other element, said pushing means and said main body portion of the other element having cooperatively engaging faces adapted to cause said pushing means to yield axially inward on the downward movement of said bar into the vertical portion of said L-shaped slot, and axially outward to force said bar into locking engagement within the horizontal portion of said L-shaped slot.



4,008,514

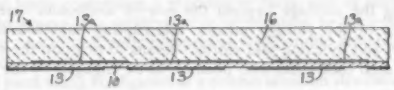
METHOD OF MAKING CERAMIC CAPACITOR

Gilbert J. Elderbaum, 896 Main St., Lynnfield Center, Mass. 01940

Continuation-in-part of Ser. No. 359,229, May 11, 1973, Pat. No. 3,882,059. This application May 5, 1975, Ser. No. 574,589

Int. Cl.² H01G *4/12, 4/30*

U.S. Cl. 29—25.42 **10 Claims**



1. A method of making capacitors in multiple which comprises defining a first pattern of a multiplicity of electrodes on a release surface, casting a thin first strip of ceramic greenware over said release surface, defining a second pattern of a multiplicity of electrodes on said strip in registry with the electrodes of said first pattern, adhering a first backing strip of ceramic greenware of greater thickness than said first strip to said first strip, removing said strips from said surface with said first pattern thereon, covering the first pattern of said first strip with a second backing strip of ceramic greenware, laminating said strips, cutting individual capacitor units including electrodes in registry on either side of said first strip from the laminated assembly and curing the units.

4,008,515

METHOD OF TRANSPORTING TOOLHOLDER

Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

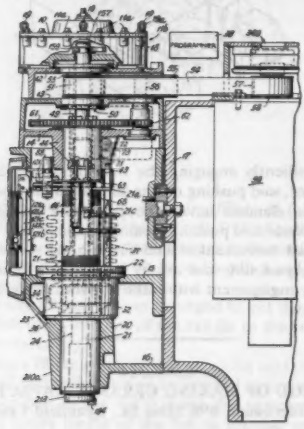
Division of Ser. No. 501,865, Aug. 30, 1974. This application June 3, 1975, Ser. No. 583,468

Int. Cl.² B23Q *3/157*

U.S. Cl. 29—426 **6 Claims**

1. A method of transferring toolholders from an indexable toolholder storage means having a row of toolholder sockets by a carriage to the spindle of a machine tool and returning the toolholder to said storage means comprising the steps of

grasping and securing to said carriage a toolholder supported in one of said sockets; with a source of power advancing the carriage with the toolholder thereon to position the toolholder beneath the socket of the spindle; causing the carriage to be raised to deposit said toolholder in said spindle socket; releasing the toolholder from the carriage; without interrupting or changing the direction of operation of said source of power, moving the empty carriage to position of rest remote from said spindle; interrupting said source of power while the toolholder in the spindle is performing work; after said work has been performed, reactivating said source of power to operate in



reverse direction to transport the empty carriage back to the spindle; securing the toolholder in the carriage; releasing the toolholder from the spindle and without interrupting said source of power, extracting said toolholder from the spindle, returning that toolholder to the storage means, depositing the toolholder in the storage socket from which it had been taken, moving the carriage beyond the row of toolholder-carrying sockets in the storage means; interrupting said source of power; and indexing said storage means to position the next-to-be used toolholder into position to be engaged by the carriage.

4,008,516

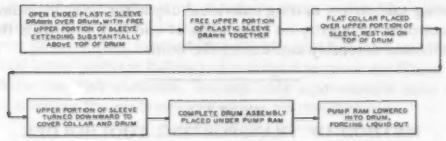
PROTECTIVE SYSTEM FOR EVACUATING DRUMS

Andrew N. Stad, Stamford, Conn., assignor to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed Oct. 24, 1972, Ser. No. 299,866

Int. Cl.² G01F *11/00*

U.S. Cl. 29—428 **3 Claims**


OPEN ENDED PLASTIC SLEEVE DRAWN OVER DRUM, WITH FREE UPPER PORTION OF SLEEVE EXTENDING SUBSTANTIALLY ABOVE TOP OF DRUM
FREE UPPER PORTION OF PLASTIC SLEEVE DRAWN TOGETHER
FLAT COLLAR PLACED OVER UPPER PORTION OF SLEEVE, RESTING ON TOP OF DRUM
UPPER PORTION OF SLEEVE TURNED DOWNWARD TO COVER COLLAR AND DRUM
COMPLETE DRUM ASSEMBLY PLACED UNDER PUMP RAM
PUMP RAM LOWERED INTO DRUM, FORCING LIQUID OUT

2. A method of removing ink from an ink drum by use of a plunger which descends into an ink drum whereby the plunger remains substantially uncontaminated from ink comprising:

placing an open ended flexible sleeve in telescoping relationship with said drum,

gathering the free end of said sleeve and inserting said free end through a collar having an aperture therein and an outside diameter substantially equal to the inside diameter of said drum,

locating said collar adjacent the open end of said ink drum,

reversing the direction of the free end of said sleeve which has been passed through the aperture in said collar and directing that portion of said sleeve that has been passed through the aperture in said collar over the drum so that when the plunger descends to force the ink from the drum the plunger remains substantially uncontaminated.

4,008,517

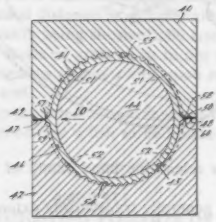
BRAKE DRUM AND METHOD OF MANUFACTURE

Carl N. Schrader, Detroit, Mich., and Frank H. Fisher, Kenton, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 374,326, June 28, 1973, Pat. No. 3,889,786. This application Jan. 22, 1975, Ser. No. 542,975

Int. Cl.² B22D *11/126*; F16D *65/10*

U.S. Cl. 29—527.6 **8 Claims**



1. A method of manufacturing a cast iron brake drum having a generally cylindrical main body portion, said method comprising:

arranging a pair of split external mold segments in spaced surrounding relationship with respect to an internal mold member to provide an annular mold cavity, the internal surfaces of said segments being generally concave and provided with a plurality of axially spaced, circumferentially extending grooves to form a corresponding plurality of axially spaced circumferentially extending ribs on the brake drum and the lateral edge surfaces of said segments being positioned in closely spaced interfacing relationship,

spacing apart the radially inward portions of the interfacing lateral edge surfaces of said external mold segments to provide a pair of spaces of substantial circumferential width and a radial dimension greater than the radial depth of said grooves, said spaces extending across the axial length of the circumferentially extending grooves provided in each adjacent pair of external mold segments,

casting molten iron into the cavity formed by said mold segments and member to fill said cavity and said grooves,

filling said spaces with molten iron during the casting operation to provide a flash base of substantial circumferential thickness at the parting lines between the external mold segments and a projection of flash metal extending radially outward from said flash base,

cooling the cast molten iron to form a durable casting,

removing said mold segments and said member from said casting, and

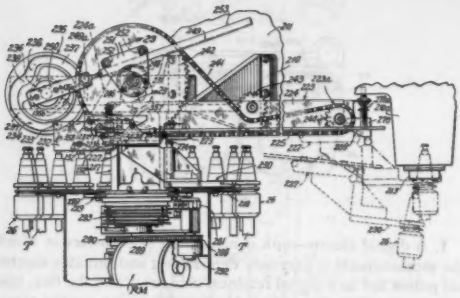
grinding away that flash metal which extends radially outward from each flash base to provide a pair of ridges of durable iron metal traversing said axially spaced, circumferentially extending ribs.

4,008,518

MACHINE TOOLS

Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 30, 1974, Ser. No. 501,865
Int. Cl.² B23Q 3/157; B65G 49/00
U.S. Cl. 29—568 **25 Claims**



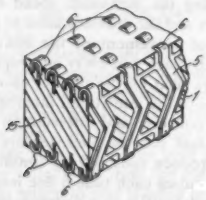
1. A tool storing and transferring device for use with a machine tool having a vertical spindle having a toolholder receiving socket comprising: a movable circular storage rack having a plurality of spaced peripheral open slots forming sockets for slidably receiving and storing therein vertically a plurality of toolholders in predetermined order and each movable horizontally to a position accessible for removal; an arm extending radially of and substantially horizontally between said storage rack and said spindle and having a carriage track thereon; a toolholder carriage mounted on said track and having a mechaical hand having means for grasping a selected one of said toolholders in said storage rack to remove it therefrom; means for causing said carriage to travel on said track from said storage rack toward said spindle to transport said toolholder to a position below and approximately vertically aligned with said spindle socket; and means for causing the portion of the track supporting said carriage, mechanical hand and toolholder thereon to be raised to insert the toolholder into said spindle socket in position to be secured in said socket.

4,008,519

ELASTOMERIC CONNECTOR AND ITS METHOD OF MANUFACTURE

Hermanus Petrus Johannes Gilissen, Esch, and Petrus Richardus Martinus van Dijk, 's-Hertogenbosch, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 549,108, Feb. 11, 1975, Pat. No. 3,954,317. This application Jan. 30, 1976, Ser. No. 653,983
Int. Cl.² H01R 43/00
U.S. Cl. 29—625 **1 Claim**



1. A method of manufacture of a connector comprising the steps of forming a plurality of strip-like flexible lamina printed circuits, each strip-like printed circuit lamina having circuit paths on one side only, the circuit paths comprising conductive strips spaced longitudinally of the strip-like lamina and each extending transversely between opposite side edge portions of the strip, forming the apertures in the insulating lamina, folding over the opposite side edge portions of each strip onto the side of the lamina devoid of circuit paths so that the transverse conductors extend externally of the folds of the side edge portions, disposing between the opposite folds of each strip-like printed circuit and adjacent the side devoid of circuits a first strip of partially cured or thermoplastic elastomeric insulating material, positioning the assemblies of printed circuit laminae and first elastomeric strips in a stack alternating with second strips of elastomeric insulating material, compressing the stack to effect extrusion of the first and second elastomeric strips through the apertures of the printed circuit laminae and into troughs within the folded side edge portions, and curing the elastomer into a homogeneous mass encasing the printed circuit laminae with convex portions of the folded conductors exposed at opposite faces of the elastomeric mass.

4,008,520

CONTACT MEMBER AND METHOD OF MANUFACTURE

Bernhard Rothkegel, and Horst Schreiner, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 112,979, Feb. 5, 1971, Pat. No. 3,927,990. This application Aug. 6, 1975, Ser. No. 602,464
Claims priority, application Germany, Feb. 7, 1970, 2005681
Int. Cl.² H01R 9/02
U.S. Cl. 29—630 C **5 Claims**

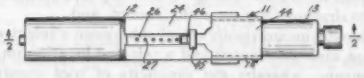
1. A method of producing a contact member for high electrical loads comprising a plurality of parts, one of said parts comprising a non-welding material resistant to burn-off, another one of said parts comprising a solderable material having electrically conductive properties, the material of each of said parts being configured as a porous skeleton structure, said parts being disposed next to each other, and both of said parts being impregnated with a metal and the interface of said parts being devoid of a boundary layer which comprises pressing a powder mixture of non-welding material resistant to burn-off to form a first part, pressing a powder mixture of solderable electrically conductive material to form a second part, sintering said second part to make the same a porous structure, placing said parts so as to be fixed in position next to each other, impregnating said first and second parts while said parts are fixed in position next to each other with impregnating metal in a single step to join said parts with said metal.

4,008,521

DENTAL TOOLS

Arthur M. Epstein, and Hans E. Baumayr, both of New York, N.Y., assignors to Baumayr Instrument Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 496,786, Aug. 12, 1974, abandoned. This application Mar. 24, 1976, Ser. No. 670,026
Int. Cl.² A61C 1/10
U.S. Cl. 32—27 **14 Claims**



1. A dental handpiece attachment comprising an articulated

member including a pair of relatively angularly adjustable proximal and distal housing sections, a longitudinally extending shaft rotatably supported in said proximal section and restricted against axial movement, a slide member longitudinally reciprocatably supported in said distal section and restricted against rotation, means for attaching a tool to the distal portion of said slide member and a rotation to reciprocation motion translator in proximal section transmitting said translation to distal member by means of a link coupling said shaft to said slide member and effective to reciprocate said slide member with rotation of said shaft substantially independently of the relative angular relationship between said tubular sections for at least a predetermined range of said angular adjustment.

4,008,522

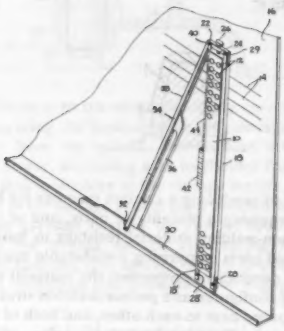
CHALKBOARD LINE TOOL

Gordon W. Anderson, 905 Canosa, Las Vegas, Nev. 89105

Filed Aug. 18, 1975, Ser. No. 605,678

Int. Cl.² B43L *13/02*

U.S. Cl. 33—44 **10 Claims**



1. A tool for use in drawing parallel horizontal lines on a chalkboard or the like, including, in combination:

a. staff means including spaced apart major surfaces and a plurality of selectively spaced passages extending between said major surfaces for receiving marker pens or the like substantially perpendicular to said major surfaces, whereby a marker pen will contact said chalkboard as one of said major surfaces leans theretoward,

b. slide means rigidly coupled to one end of said staff means and having a lower edge adapted for sliding in a blackboard chalk tray, wherein said slide means and said staff means are secured one to another, by means of a vertical frame member which is secured at one end thereof to said slide means,

c. said staff means slidably engaging said vertical frame member to allow for the adjustable positioning of said staff means relative to said frame member prior to drawing lines on a chalkboard,

d. a vertical adjustment screw disposed through an opening in said frame member and threadably engaged to said staff means for raising or lowering said staff means prior to drawing lines on a chalkboard, and

e. handle means rigidly coupled between a selected location on said slide means and a selected location on said staff means, whereby the simplicity of tool construction is achieved by maximizing the function of each of said staff means, said slide means, and said handle means.

4,008,523

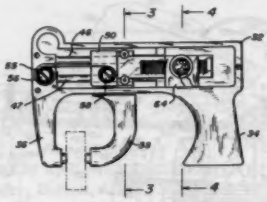
DIGITAL ELECTRO-OPTICAL MICROMETER AND GAGES

Geza von Voros, Glen Rock, N.J., assignor to Optograms, Inc., Oakland, N.J.

Continuation-in-part of Ser. No. 229,944, Feb. 28, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,272

Int. Cl.² G01B *11/04*

U.S. Cl. 33—143 L **4 Claims**

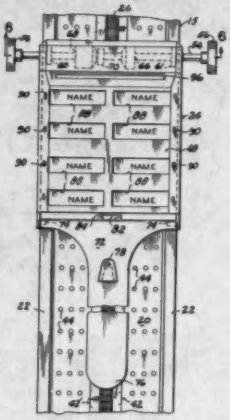


1. A digital electro-optical measuring micrometer in which the measurement is precisely determined and initiates electrical pulses fed to a digital readout, computer and the like, said micrometer including: (a) a U-shaped housing readily transportable to a point of measurement and within which all mechanically movable elements used to derive the precise measurement are self-contained, said housing further including a fixedly supported anvil; (b) a movable anvil carried by a precision guide means for movement toward and away from the fixedly supported anvil, said guide means disposed within the housing so that the movable anvil is precisely movable along a prescribed precision path and for a distance which is at least as great as the linear differential meaurement capacity of the micrometer; (c) a constant force spring attached at one end to the housing and at the other end to the movable anvil so as to urge the movable anvil from a maximum open to a closed condition and toward and to the supported anvil and all intermediate positions therealong with an equal and selected force at all positions from and including the open and closed positions so that at the time of measurement the force applied by the moveable anvil is equal, consistent and predetermined; (d) and encoder containing a light source and a pair of photosensors and including a passageway therethrough for a linear scale-like interrupter member, the encoder carried by the housing; (e) a linear interrupter member carried by and precisely moved in said passageway with the movement of the movable anvil against and with the bias of the constant force spring, said interrupter member having a sequence of a multiplicity of precisely equally spaced lines disposed thereon; (f) said light source and photosensors being positioned so that the lines of the interrupter member interrupt the beam of light as the interrupter member is moved, said interruptions as read by the photosensors being converted to electrical pulse signals; (g) a dash pot having a piston movable therein, said piston being movable by and with the movement of the movable anvil in association with said constant force spring for establishing means for regulating the maximum speed of travel of the interrupter member and the movable anvil to establish a sufficiently slow rate of movement of the interrupter member whereat and whereby each and every interruption of the beam of light is distinctly read by the photosensors to insure that each and every line of the interrupter member as it interrupts the beam of light converts said interruption to an electrical pulse signal; (h) said pair of photosensors being optically aligned so as to produce substantially simultaneously phase-shifted waves and pulses each time a line interruption occurs and to feed this information to a discriminator circuit which ascertains the direction of travel at that instant, and (i) a digital counter and readout adapted to receive said electrical signals and convert said pulse signals to information which is fed to converting apparatus such as a computer, memory, indicia display and the like with said information corresponding to the precise linear movement of the movable member.

4,008,524
GROWTH MEASURING SCALE

Cloy L. Allen, P. O. Box 224, Wingate, Tex. 79566

Filed Feb. 20, 1976, Ser. No. 659,887
Int. Cl.² G01B 5/02, 3/20
U.S. Cl. 33—169 R 7 Claims



1. A growth measuring scale, comprising:

elongated rigid panel means adapted to be vertically secured to a wall surface,

said panel means having spaced-apart rails forming a pair of coextensive tracks;

a primary rack coextensive with and secured to said panel means between said tracks;

indicia indicating units of measurement extending longitudinally along said panel means on opposite sides of said rack;

a head member having track engaging walls vertically slidable along said tracks;

manually rotatable control shaft means extending transversely through said head member and engageable with said primary rack for moving said head member relative to said panel means; and,

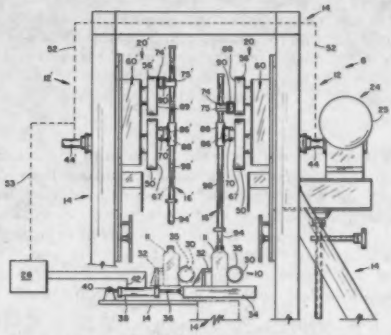
a head bar pivotally connected, at one end, with said head member for vertical pivoting movement of its other end portion about a horizontal axis toward and away from said panel means for determining the position of the lowermost limit of said head bar with respect to said indicia when the head bar is horizontally disposed.

4,008,525
APPARATUS FOR PROCESSING WARE

Anthony T. Zappia, Carmel, Ind., assignor to Ball Brothers Service Corporation, Muncie, Ind.

Filed Apr. 19, 1976, Ser. No. 678,252
Int. Cl.² G01B 3/46
U.S. Cl. 33—174 L 9 Claims

1. An apparatus for testing ware comprising a testing station and means for conveying ware past said station, said conveying means defining a conveying path, said testing station including a first test member and first means for moving said first test member from a starting position toward said conveying path to engage ware, along the path in the direction of movement of the ware, away from the path to disengage the ware, and then to return to said starting point, said first moving means comprising first and second cranks spaced apart along said conveyor path with their axes parallel and extending transversely to said path, each said crank having a radially displaced crank pin extending axially outwardly therefrom, an orbital link having opposite ends supported respectively on said crank pins, means for mounting said first test member on said link for movement thereon toward and away from said conveyor path, a third crank having an axis parallel to said first and second crank axes and having a third radially displaced crank pin extending axially therefrom, means for connecting said first test member to said third crank pin, and first means for synchronously driving said cranks, said first synchronous drive means comprises an endless flexible means trained about said first, second and third cranks said first,

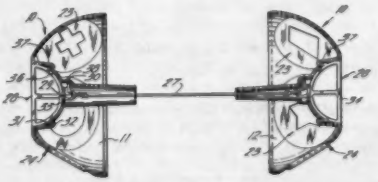


second and third cranks including means for adjusting the radial displacements of said first, second and third crank pins, respectively, the radial displacement of said first and second crank pins being adjustable to vary the extremes of motion of said first test member in its motion along said conveying path, the radial displacement of said third crank pin being adjustable to vary the extremes of motion of said first test member in its motion toward and away from said conveying path.

4,008,526
OPENABLE CURVILINEAR OPENINGS OF DIFFERENT GEOMETRICAL SHAPES

James B. Swett, Barrington, and Harold P. Ashton, Providence, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 752,025, Aug. 12, 1968, abandoned.
This application Oct. 2, 1972, Ser. No. 297,585
Int. Cl.² G09B 19/00
U.S. Cl. 35—22 A 3 Claims



1. A toy adapted for the introduction into and storage therein of individual block members and comprising an enclosed hollow body member having curvilinear surface portions and a plurality of plane defining portions adjacent one another, said plane defining portions being adapted to maintain said toy in stable resting positions on any suitable supporting surface and further having openings of different geometrical shapes formed therein communicating with the interior of said hollow body member, each of which is adapted only to accommodate the passage therethrough of a said block member which is of the geometrical shape corresponding thereto, and additional means to gain access to the interior of said hollow body for removing said block members therefrom.

4,008,527

EDUCATIONAL ACCOUNTING DEVICE

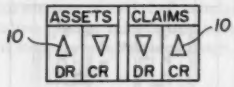
Snyder M. Zegel, 108 Monell Ave., Islip, N.Y. 11751

Continuation-in-part of Ser. No. 462,439, April 19, 1974, Pat. No. 3,889,395. This application Apr. 2, 1975, Ser. No. 564,458

The portion of the term of this patent subsequent to June 17, 1993, has been disclaimed.

Int. Cl.² G09B *19/18*

U.S. Cl. 35—24 R **3 Claims**



1. A transaction card adapted for use with an educational accounting device comprising: a flat rectangular body having an upper and a lower portion and bearing accounting indicia on the face thereof; a pair of adjacent disks rotatably attached to said upper portion and protruding slightly from the top edge of said body; a sight window on the face of said body in proximity to said top edge; each disk having a circular series of numerals from 0 through 9 appearing thereon whereby each disk may be conveniently turned by the fingers and thereby selectively display one numeral from each disk through said sight window; and, the numerical value displayed through said window together with said accounting indicia representing a part of an accounting entry.

4,008,528

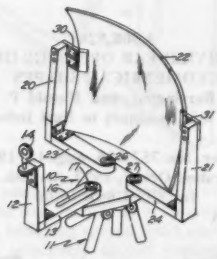
DRAWING APPARATUS

Richard A. Caulfield, 5 Connors Ave., Westerly, R.I. 02891

Filed Mar. 22, 1976, Ser. No. 669,148

Int. Cl.² G09B *11/06, 11/10*

U.S. Cl. 35—26 **4 Claims**



1. A drawing apparatus comprising an eyepiece, a marking surface through which the scene to be drawn may be viewed, said marking surface being arcuate and substantially equally distant at all areas from said eyepiece, mounting means for holding said eyepiece and marking surface in fixed relation for aiming at the scene to be produced on said marking surface.

4,008,529

TEACHING APPARATUS AND METHOD

Neil Yorkston, 21 Liskeard Gardens, Blackheath, London SE3 OPE, England

Continuation of Ser. No. 509,461, Sept. 26, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 629,832

Int. Cl.² G09B *17/00*

U.S. Cl. 35—35 E **12 Claims**

1. A visual display apparatus for use in controlling the observable information content of an arbitrarily selectable page of written material bearing intelligible indicia of one visual characteristic disposed on a background of a distinguishable second visual characteristic comprising:

a plurality of transparent sheets adapted to overlie the page of written material in an arbitrarily selectable position relative to said page and removable therefrom, each of said sheets containing a field of opaque blots spaced irregularly relative to said written material, the area of said sheet containing said field being otherwise substantially transparent, said blots on each sheet being disposed to obscure a plurality of portions of the written material, said portions being small relative to said written material,

said blots on each sheet being arranged in relation to the opaque blots on others of said sheets to obscure different portions of the written material and progressively obscure a greater amount of said written material as additional ones of said sheets are placed over said page; and

means separable from said page and attached to each of said plurality of transparent sheets adjacent an edge portion thereof to permit said transparent sheets to be disposed in overlying relationship and to maintain said sheets in registry.

4,008,530

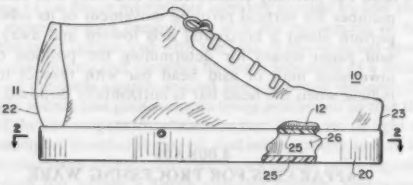
INFLATABLE SOLE SHOE

Dennis J. Gager, Medford, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 5, 1976, Ser. No. 646,614

Int. Cl.² A43B *13/18*

U.S. Cl. 36—28 **1 Claim**



1. An orthopedic inflatable shoe, formed with a first inflatable sole section and a second inflatable inner sole section, with each of said sole sections individually fitted with valves for independent inflation of each said section by a fluid under pressure,

each said inflatable section formed of a top wall, and a bottom wall joined continuously together by a side wall, with

the first inflatable sole section shaped so that in the inflated condition, the upper wall is generally flat and the bottom wall extends from the said upper wall by a greater distance at the front portion of the sole section than at the rear portion of the sole section, and with

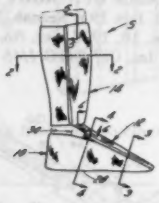
the second inflatable section shaped so that in the inflated condition, the bottom wall is generally flat and the top wall is formed as a convex arcuate surface extending along the longitudinal axis of the said second sole.

4,008,531

PROTECTIVE FOOTWEAR

Tibor Schonbrun, Montreal, and Victorie Tremblay, Laval, both of Canada, assignors to Genesport Industries Limited, Montreal, Canada

Filed Mar. 4, 1976, Ser. No. 663,749
Int. Cl.² A43B 00/00; A41D 17/00
U.S. Cl. 36—106 11 Claims



1. A protective device adapted to protect the foot and shin area of a person, said device comprising a first member adapted to fit about the heel area, a second member adapted to cover the top portion of the foot, and a third member covering at least a portion of the shin area, said three members being secured together to form a composite structure, each of said members being formed of a core of protective material and a covering thereabout, each of said coverings having at least one flange situated along an edge of said members, said members being secured together by means of said flanges.

4,008,532

SKI BOOT

Lawrence Layton Kilbourn, Middletown, Conn., and Robert Brunkhorst, Nashua, N.H., assignors to Olin Corporation, New Haven, Conn.

Filed July 12, 1976, Ser. No. 704,213
Int. Cl.² A43B 5/04
U.S. Cl. 36—120 4 Claims

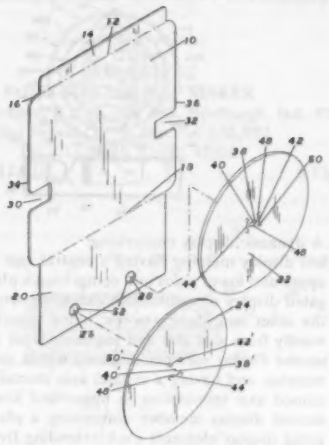
1. In a ski boot of the rear or modified top entry variety which includes a plastic shell having a forward part and a rearward part hingedly connected together, a hinge structure comprising: a projection formed in one piece with and of the same material as one of said boot parts, said projection having a major dimension which extends transversely of the boot and said projection having a basal stem part of restricted thickness, when measured perpendicularly to said major dimension, merging with a terminal head part of expanded thickness, when measured perpendicularly to said major dimension; and a groove in the other of said parts, said groove extending transversely of the boot and having an open mouth of restricted dimension through which said stem extends, and an enlarged bottom part in which said head is disposed, said mouth being sufficiently restricted to prevent said head from being passed therethrough in a direction to disconnect said one boot part from said other boot part.

4,008,533

PRICE MARKER

William Greenberger, White Plains, N.Y., assignor to The Hopp Press, Inc., New York, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,249
Int. Cl.² G09F 11/04
U.S. Cl. 40—70 R 1 Claim



1. A changeable price marker, which comprises; a first sheet having an aperture therein; a circular second sheet having

1. a primary first slit therein beginning at a first point and terminating at a second point, each of said points being at a position on said second sheet apart from the peripheral edge thereof, the distance between said first and second points being greater than the largest dimension of said aperture;
2. a secondary second slit transverse to said first slit, traversing said first point, originating and terminating at third and fourth points, respectively, said third and fourth points being at positions apart from the peripheral edge of said second sheet;
3. a secondary third slit transverse to said first slit, traversing said second point, originating and terminating at fifth and sixth points, respectively, said fifth and sixth points being at positions spaced apart from the peripheral edge of said second sheet;
4. tertiary fourth, fifth, sixth and seventh slits originating at points third, fourth, fifth and sixth, respectively, and extending at an obtuse angle to the respective secondary slits, a distance sufficient to form tabs defined by said fourth, fifth, sixth and seventh slits, respectively, together with the adjacent portions of said primary slit and said secondary slits;

said first and second sheets being interconnected by superimposing said second sheet over said first sheet, aligning the mid-point of said primary first slit with the center of said aperture and pressing said tabs through said aperture;

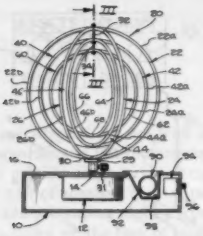
whereby said interconnection permits rotary movement between said first and second sheets;

said second sheet having printed on a planar surface pricing indicia; and a portion of said first sheet foldable over said second sheet, a cutout section of said portion exposing said pricing indicia to view.

4,008,534
ROTATING DISPLAY WITH BLACK LIGHT ILLUMINATION

Gordon P. Swartz, 22945-A Nadine Circle, Torrance, Calif. 90505

Filed Sept. 22, 1975, Ser. No. 615,551
Int. Cl.² G09F *13/34*
U.S. Cl. 40—106.52 10 Claims

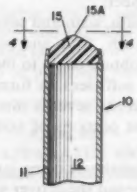


1. A dynamic display comprising:
a first display member having a central axis terminating at upper and lower poles and comprising a plurality of elongated display elements each extending from one pole to the other and, therebetween, being spaced radially outwardly from said axis and angularly from one another;
a second display member disposed within said first display member and having a central axis shorter than the first named axis terminating in upper and lower poles, said second display member comprising a plurality of elongated display elements each extending from one of said second named poles to the other and, therebetween, being spaced radially outwardly from said second axis and angularly from one another;
a thin elongated flexible support element fixed at one end to the upper pole of the first display member and at its other end being supportingly attached to the upper pole of the second display member;
and means for rotating said first display member about its axis.

4,008,535
WRITING INSTRUMENT TOP

Olof Verner Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence and Providence Plantations, R.I.

Filed June 17, 1974, Ser. No. 480,005
Int. Cl.² G09F *3/00*
U.S. Cl. 40—334 4 Claims

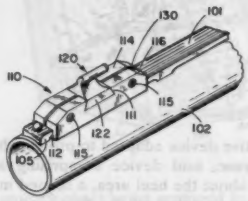


1. A writing instrument top consisting of a hollow tube having a wall and an axial passageway, the thickness of said wall being a selected unit of measure, a counterbore in said wall located in one end of said hollow tube having a depth equal to three times the selected unit of measure, and having a diameter to provide a shelf in said wall with a width, one half the selected unit of measure, an ornament having a bottom and a side provided with an approximate 5° taper from said bottom upward, said ornament being adapted to be inserted into said axial passageway with said bottom engaging said shelf, and spinning said wall against said tapered side to secure said ornament in said counterbore through engagement of said wall with said approximate 5° tapered side.

4,008,536
DETACHABLE GUN SIGHT MOUNTS

Jean M. Adams, P.O. Box 193, Neenah, Wis. 54956

Filed Mar. 10, 1975, Ser. No. 557,054
Int. Cl.² F41G *1/46*
U.S. Cl. 42—1 S 13 Claims



1. A readily detachable gun sight mount which cooperates with a second gun sight mount of similar construction to provide a conventional shotgun with a mounting mans for mounting a pair of rifle-like sights to said shotgun without the need for modification of the shotgun barrel or its associated structures and said gun sight mount having a body comprising:
a. an upper sight mounting portion formed to mount a gun sight,
b. a lower noncircumferential clamping portion for clampably attaching said gun sight mount to an existing longitudinal gun barrel structure,
c. at least one portion of said gun sight mount having formed thereto an indexing means and an engaging means for mechanically engaging with and indexing to a gun barrel structure, and
d. fastening means for maintaining said gun sight mount in clamping attachment with said gun barrel structure, and wherein said body comprises two body members; a first body member, and a second body member, and the lower portions of said body members are configured so that when said first body member is assembled with said second body member said lower portions combine to form a longitudinal groove which conforms to the geometries of a longitudinal segment of a gun barrel structure and said longitudinal groove is configured to embrace more than 60% but less than 100% of said longitudinal segment of said gun barrel structure.

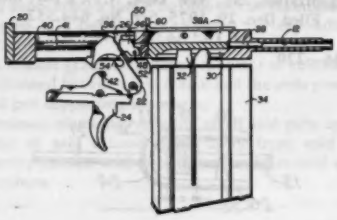
4,008,537
MODIFICATION OF RIFLE ADAPTER ASSEMBLY TO PREVENT DOUBLING

Ronald E. Elbe, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,154
Int. Cl.² F41C *11/00, 21/10*
U.S. Cl. 42—16 9 Claims

1. A conversion unit for a rifle bolt for a rifle having a hammer, and a firing pin on the rifle bolt, said unit being used to prevent doubling by insuring that the rifle hammer is cocked upon recoil of the rifle bolt before chambering a subsequent round upon counterrecoil of the bolt, said conversion unit comprising:
a bolt extension block affixed to the aft end of said bolt, said block having an extended hammer cocking surface for engaging said hammer during recoil, and

an extension movably mounted on said block for transmitting striking force from said hammer to the firing pin on said bolt.



4,008,538

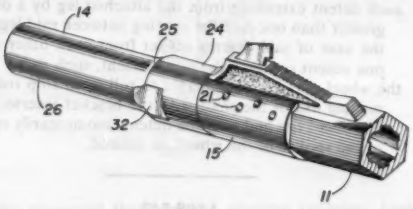
GUN

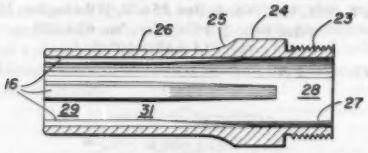
Warren A. Center, Laurel Road, Westminster, Mass. 01473

Continuation of Ser. No. 405,021, Oct. 10, 1973, abandoned, which is a continuation of Ser. No. 235,617, March 17, 1972, abandoned, which is a continuation of Ser. No. 869,135, Oct. 24, 1969, abandoned. This application Mar. 14, 1975, Ser. No. 558,467

Int. Cl.[2] F41C *21/00*

U.S. Cl. 42—78 **3 Claims**





1. A gun for use alternately with a shotgun shell and a bullet, comprising:

a. a barrel having spiraled rifling, an axial bore, and a muzzle at an end of the barrel,

b. a first tubular integral element attachable to the muzzle of the barrel and having a first end and a second end, the inner surface of the element being formed with longitudinally-extending vanes to remove spiral motion from shot to prevent it from spreading as it leaves the gun, the inner surface of the tubular element consisting of a cylindrical bore extending entirely therethrough and coaxial with the bore of the barrel, the tubular element consisting of a first portion located adjacent the first end of the element adjacent the muzzle and having no vanes, and a second portion located adjacent the second end of the element having vanes which extend inwardly a substantial distance, thereby defining a cylinder coaxial with and having a smaller diameter than the bore of the barrel, and a third portion between the other two portions having parts of the vanes which increase smoothly in a radial extent from a zero radial extent at the first portion to the full radial extent at the second portion while the bore remains the same size, the second and third portions extending substantially the same substantial axial distance, and

c. a second tubular element provided with gas vents interposed between the muzzle of the barrel and the first-mentioned first tubular element, the outer end of the second tubular element being provided with internal threads and the first tubular element being provided at the said first end with cooperating external threads, the first tubular element being provided with flat wrench-engaging surfaces.

4,008,539

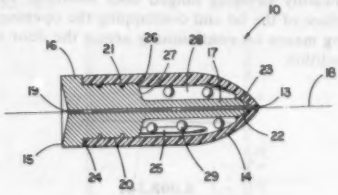
NOISE MAKING SLIP SINKER

Jeffrey O. Gardner, R.R. 5, Box 492, Newburgh, Ind. 47630

Filed Nov. 5, 1975, Ser. No. 628,892

Int. Cl.[2] A01K *85/00, 95/00*

U.S. Cl. 43—42.31 **8 Claims**



1. A slip sinker which comprises:

a shell having a distal end defining an opening and having a proximal end defining an aperture;

a guide plug having a plug portion which is sealingly received near the distal end of the shell and having a guide portion extending inside the shell from the plug portion to the proximal end of the shell, the guide portion having a proximal end which is sealingly received near the proximal end of the shell, the guide plug having a passageway extending therethrough from the plug portion to the proximal end of the guide portion, each end of the passageway being accessible from outside the shell, a chamber being defined by the interior wall of the shell, the guide portion and the plug portion;

at least one noise-making object loosely held within the chamber; and

the plug portion having a first surface sealingly received near the distal end of the shell, the first surface including a recess whereby a softened portion of the interior wall of the shell may be received for causing the guide plug to be firmly sealed with the shell.

4,008,540

INSULATED FISHING CREEL

Jerrold J. Brower, 319 W. Riverside Ave., Kellogg, Idaho 83837

Filed Nov. 13, 1975, Ser. No. 631,486

Int. Cl.[2] A01K *97/04*

U.S. Cl. 43—55 **7 Claims**

1. An insulated fishing creel, comprising:

an upwardly open container formed of heat insulating material and including upright side walls defining an open container top and joined together about a horizontal bottom wall;

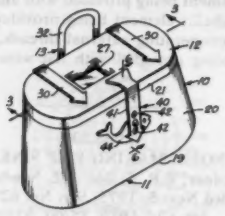
a container lid also formed of heat insulating material;

integral flexible hinge and handle means for hingedly connecting the lid to the container to cover the container top and to provide a grip for holding the creel;

said integral flexible hinge and handle means being attached to the exterior of one of the side walls and extending

upward along the side wall and over the container lid and attaching to the container lid;

an inwardly facing bead extending about an inner surface of the lid for releasable mating engagement with the side walls at the container top to selectively seal the container interior;



an opening formed through the lid;

an inwardly swinging hinged door mounted to an inside surface of the lid and overlapping the opening; and

biasing means for continuously urging the door to a closed condition.

4,008,541

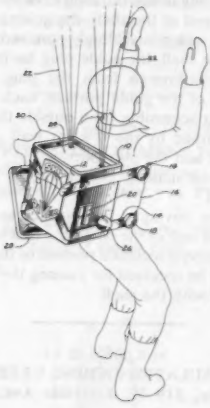
TOY PARACHUTE

Martin R. Russer, P.O. Box 5564, Santa Barbara, Calif. 93108

Filed July 28, 1975, Ser. No. 599,933

Int. Cl.² A63H *33/20*

U.S. Cl. 46—86 R **10 Claims**



1. A parachute toy including;

a container

a piston within the container

means to latch the piston within the container to provide a space for receiving a parachute and shroud lines;

a parachute attached to the container by shroud lines;

spring means to drive the piston within the container to eject the parachute and shroud lines from said space;

an air duct to vent air to the space vacated by the piston as it ejects the parachute to prevent vacuum retardation of the ejection action; and

means to release the latch means whereby upon being latched and loaded with the parachute, the toy may be actuated to eject the parachute.

4,008,542

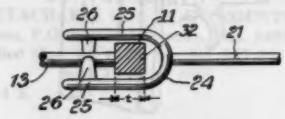
SOUNDING TRUNDLE AND HOOP

Chris J. Schneider, McAllen, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 29, 1975, Ser. No. 644,552

Int. Cl.² A63H *33/02*

U.S. Cl. 46—220 **1 Claim**



1. A toy comprising a spoked wheel and a push-pull rod that may be employed to rotate the wheel in a reciprocal motion,

said wheel being formed with a rim joined to a hub by a plurality of spokes,

said push-pull rod formed of a shaft fixed at one end to a U-shaped bracket of a size to fit about the wheel rim,

said U-shaped bracket formed of a mid-section joined to a pair of spaced legs generally parallel to each other and to the shaft and extending away from said shaft, with a flexible detent mounted to the inside of each leg of the bracket, each said detent located at a distance from the said bracket mid-section that is greater than the thickness of the rim of the said wheel so as to be in a position to engage a spoke of the said wheel when the bracket is fitted about the said rim, with

each detent extending from the attached leg by a distance greater than one-half the spacing between said lege, with the axes of said detents off-set from each other so that one detent overlaps the other detent, such that

the wheel may be manipulated to roll or to stop rolling by manual use of the shaft with the bracket inserted about the wheel rim and with the detents momentarily engaged to the spokes of the wheel, as desired.

4,008,543

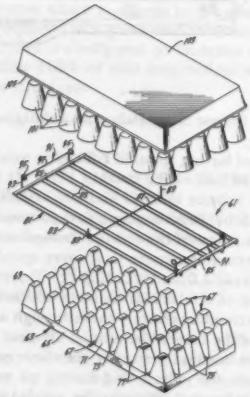
METHOD AND APPARATUS FOR POSITIONING DEFORMABLE POTS IN A PREDETERMINED ARRAY

Anton L. Vilt, R.R. No. 4, Box 356-D, Wilmington, Ill. 60481

Filed Feb. 2, 1976, Ser. No. 654,388

Int. Cl.² A47G *29/00*

U.S. Cl. 47—1 A **18 Claims**



1. An apparatus for use in positioning deformable pots in a predetermined pattern for insertion in a flat or like container, comprising:

a frame, including a rim defining a central opening and a

plurality of individual, upstanding pot supporting members arranged in a predetermined pattern filling said central opening, each pot supporting member engaging and supporting a single flexible pot to maintain a plurality of pots in a tightly packed array corresponding to said pattern,

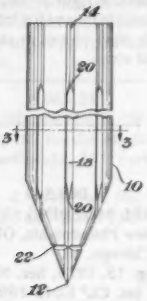
and a release grate, including a member of release elements positioned between said frame and the pots positioned on said pot supporting members,

said release elements engaging all of said pots upon movement of said release grate away from said frame to thereby release said pots in unison from said supporting members.

4,008,544
PLASTIC PLANTING CONTAINER

Walter E. F. Rupprecht; Eckel R. Lane, and Joseph W. Rakshys, Jr., all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 8, 1975, Ser. No. 611,287
Int. Cl.² A01G *9/02*
U.S. Cl. 47—77 **6 Claims**

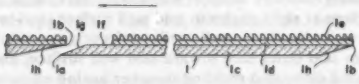


1. An elongated thermoplastic planting container having one end generally pointed and an opposite end open for receiving soil and seedling, said container formed with substantial orientation strength in its longitudinal direction and with a lack of substantial orientation strength in the transverse direction, and a plurality of openings extending longitudinally along the container sidewall to further weaken the container in said transverse direction.

4,008,545
MACHINE FOR PREWORKING OVERLAPPING ABRASIVE COATED BELT JOINT

Sakae Koide, Tokyo; Masatoshi Ishii, Inagi, and Yukiharu Yamamoto, Tokyo, all of Japan, assignors to Tajara Shoyei Kiko K.K., Tokyo, Japan

Filed Feb. 10, 1976, Ser. No. 656,801
Claims priority, application Japan, June 10, 1975, 50-70035
Int. Cl.² B24B *7/02*; B32B *31/04*
U.S. Cl. 51—5 C **1 Claim**

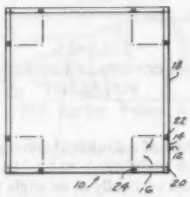


1. A machine for preworking overlapping abrasive coated joint comprising an original roll unit section, a cutting and working unit section, and a slit unit section, wherein in said cutting and working unit section, a horizontal table (9) has a knife blade (21) attached to its forward end, first and second flaps swivellably mounted on said cutting and working section by means of a shaft in such a way that their end portions are brought to the position flush with said knife edge and in contact therewith, a pointing plate, a belt material hold down roller is disposed on the top surface of said second flap, and furthermore, in said cutting and working unit section, an upper working unit and a lower working unit are disposed above and below said horizontal table, said upper working unit having a circular cutter for cutting the grinding belt material, a grinding wheel for skiving, and a shaving grinding belt for pointing the upper end surface of the grinding belt material, and said lower working unit having a shaving grinding belt for pointing the lower end surface of the grinding belt material which is being pinched between said second flap and said pointing plate.

4,008,546
BUILDING CONSTRUCTION

Panagiotis Bourboulis, 236 Uxbridge Road, Hayes, Middlesex, England

Filed Apr. 22, 1976, Ser. No. 679,236
Int. Cl.² E04B *1/346*
U.S. Cl. 52—65 **5 Claims**



1. An improved building construction including at least one first juncture, a fixed floor and a fixed ceiling, a pair of fixed walls joining said floor and ceiling and extending toward said juncture, means for permitting the alteration of the building's appearance both exteriorly and interiorly from one shape to another at the desire of the building's owner and for his psychological benefit utilizing essentially the same building materials within a relatively short and reduced period of time at minimum cost and expense to the owner while coordinating the altered appearance with the original architectural design, said means including a pair of movable wall portions, said movable wall portions meeting at said juncture and enclosing a first peripheral area of the building construction adjacent said juncture connecting means connecting said movable wall portions to said fixed walls at a locations spaced from the juncture and said movable wall portions being shiftable about said connecting means and being thus movable from a first position which encloses the first peripheral area to a second position so as to open and expose the first peripheral area to thereby change the enclosed space and accordingly alter the shape and appearance of the building.

4,008,547
IN-GROUND SWIMMING POOL

Frederick Katzman, 5 Stonewyck Drive, Belle Meade, N.J. 08502

Filed Aug. 11, 1975, Ser. No. 603,334
Int. Cl.² E04H *3/16*
U.S. Cl. 52—169.7 **1 Claim**

1. A swimming pool construction comprising:

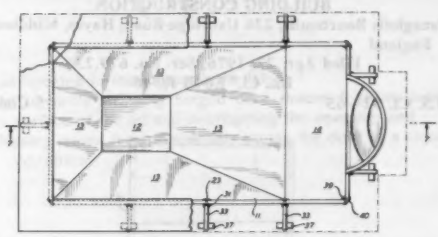
a. vertically disposed coplanar panels having a front and a back defining the wall of a swimming pool,

b. vertical edges of the panels in abutment with each other,

c. a first channel at the back of a pair of the panels at their vertical abutting edges,

d. a convex wall-joint attached to the first channel and covering the front of the pair of panels, at their vertical abutting edges, the wall-joint being convex with relation to the front of the pair of panels,

e. means to attach together the first channel and the convex wall-joint to seize the pair of panels together, at their vertical edges,
f. a generally triangular brace, having two side edges,
g. one side edge of the triangular brace seated in and attached to the first channel,
h. a second channel horizontally attached to at least a portion of the other side edge of the triangular brace,
i. a support under the second channel,
j. a third channel attached at the top of the panels,
k. a deck member having an inner edge and an outer edge attached at its inner edge in the third channel,
l. double-channel members, having a regular channel and an adjacent offset channel,
m. regular channels of the double channel member attached to the bottom edges of the panels,



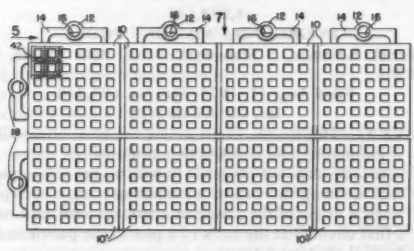
n. regular channels of a double channel attached to an outer edge of a deck member,
o. panels disposed vertically at an angle to each other defining a corner of a wall of a swimming pool,
p. a corner-joint disposed vertically inside the corner of the wall,
q. a bolt channel on the back of the corner-joint,
r. a pair of arms on the corner joint, extending over the front portions of the panels which define a corner of the wall of the swimming pool,
s. a corner back-up joint disposed vertically outside the corner of the wall of the swimming pool,
t. a pair of flanges on the back of the corner back-up joint,
u. the panels defining a pool wall corner having their vertical edges seated on the flanges,
v. means to attach the corner-joint and the corner back-up joint together and to seize the panels, defining a corner.

4,008,548

PLAYING SURFACE

Raymond W. Leclerc, 1045 Oakhill Road, Fitchburg, Mass. 01420

Filed Sept. 24, 1975, Ser. No. 616,497
Int. Cl.² E04F *15/00*
U.S. Cl. 52—180 **4 Claims**



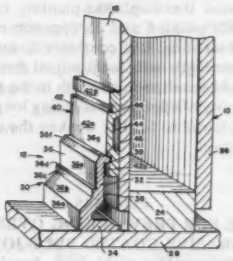
1. A supplementary surface construction comprising a series of rectangular plastic molded one-piece strips, a plurality of apertures in each strip,
outstanding interlocking loops integral with each strip arranged along the long side edge thereof, each loop containing a straight edge snap over tooth,
outstanding free-ended projections at the two opposite edges from said loops, each projection including a straight side snap over tooth complementary to and for cooperation with the teeth in the loops of the next succeeding strip,
and a interlocking snap over loop integral with said strip at one end thereof for interlocking engagement with a projection on an extending strip,
a plurality of supporting pins depending from the lower portion of said surface construction to support the same in elevated condition on a supporting floor or ground surface,
said loops extending upwardly from the supporting floor only partially to the top surface of the construction and the projections extending substantially the full height of the construction,
the loops extending outwardly laterally of the construction, the projections lying wholly within the area of the construction,
each of said plastic one-piece molded strips comprising a plurality of generally rigid pieces serially connected in said strip, and flexible means for interconnecting adjacent of said generally rigid pieces in said strip and providing flexibility to said strip.

4,008,549

PANEL MOLDING SYSTEM

Michael J. Dobija, New Philadelphia, Ohio, assignor to Masonite Corporation, Chicago, Ill.

Filed Aug. 15, 1975, Ser. No. 605,025
Int. Cl.² E04F *19/02*
U.S. Cl. 52—287 **12 Claims**

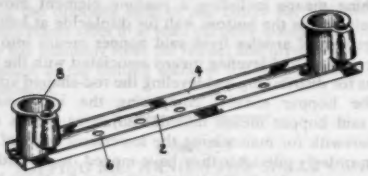


1. A panel molding system comprising, in combination;
a first elongated molding member having an outer viewing face and an opposite back face adapted to confront in spaced apart relation a wall surface or the like, said first member having a longitudinally extending base portion along a lower edge of said faces having an inwardly extending support surface adapted to rest on a floor or surface at right angles to said wall surface, and including a longitudinally extending rib projecting oppositely away from said outer face toward said wall surface, and
a second elongated molding member having an outer viewing face and an opposite back face adapted to confront said wall surface, said second member adapted to be spaced from said floor or right angle surface and having a longitudinally extending groove defined in said outer face thereof and spaced between upper and lower edges dimensioned to interlockingly receive at least a portion of said rib of said first member when placed in partially overlapping relation on said second member.

4,008,550
DEVICE FOR SETTING SOCKETS FOR SWIMMING POOL LADDERS

Samuel Kaufman, P.O. Box 1124, Hagerstown, Md. 21740

Filed Sept. 19, 1974, Ser. No. 507,608
Int. Cl.² E02D 27/00
U.S. Cl. 52—298 1 Claim



1. An arrangement for setting sockets for swimming pool ladders comprising an elongated channel member having two sockets carried thereby at the proper distance to receive the ends of a ladder, such channel member comprising a body portion having holes therein in an area outside the area of the sockets and having upwardly directed and inwardly bent longitudinal flanges, whereby, when deformed rods are driven through some of the holes and the channel is filled with grout, the unit is held firmly in proper position during the pouring and curing of the deck.

4,008,551
RELIEF PANEL AND METHOD OF MAKING SAME

Edward J. MacDonald, 180 Border St., Scituate, Mass. 02066, and Kenneth A. MacDonald, 251 York St., Canton, Mass. 02021

Filed Apr. 4, 1975, Ser. No. 565,143
Int. Cl.² E04C 1/40
U.S. Cl. 52—316 9 Claims

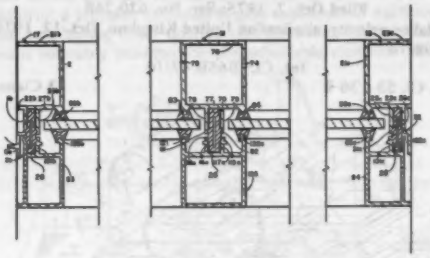
4. A relief panel, comprising
a. a relatively thick one-piece core,
b. a relatively thin hard plastic veneer bonded to the outer surface of said core,
c. said panel being formed inwardly from the edges thereof with an elongated undercut groove of substantially constant width and depth in a predetermined pattern completely through said veneer and partially into said core,
d. an elongated hard plastic veneer strip of substantially constant width mounted over at least one exposed wall of said core groove, the outermost edge of said strip being in butting edge-to-edge contact with the edge of said veneer bordering said groove to form a substantially continuous veneer surface therewith.

4,008,552
WALL STRUCTURE AND ELEMENTS THEREFOR

Lawrence F. Biebuyck, Dallas, Tex., assignor to Howmet Corporation, New York, N.Y.

Continuation of Ser. No. 378,321, July 11, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,820
Int. Cl.² E04B 1/62; E04C 2/38
U.S. Cl. 52—397 5 Claims

1. A wall structure assembly including: a pair of frame members each having an elongate body, a first pair of longitudinal parallel flanges extending outwardly therefrom on a face of said body centrally of said face and a second pair of longitudinal parallel flanges extending outwardly therefrom on said face at the edges thereof; and a generally T-shaped joint clip for connecting one end of one of said members to the other of said members intermediate its ends to join said members in perpendicular relationship, said joint clip including a head portion connectible to said flange bearing face of said other of said members outwardly of said first pair of parallel flanges thereon and inwardly of one of said second pair of parallel flanges thereon; and a rib portion extending perpendicularly from said head portion and telescopical between the first pair

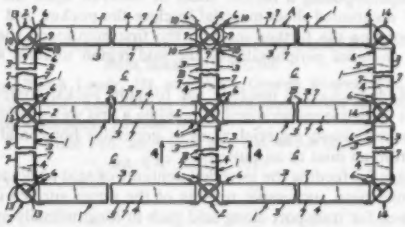


of parallel flanges of said one of said members when said one end is positioned adjacent and perpendicular to said other of said members; and means for securing said rib portion to at least one of said flanges of said one of said members.

4,008,553
WALL PANEL STRUCTURE AND CONNECTING MEANS THEREFOR

Wayne H. Oliver, 1305 Spring Valley Road, Minneapolis, Minn. 55422

Filed Apr. 19, 1976, Ser. No. 678,242
Int. Cl.² E04B 1/08; E04C 1/10
U.S. Cl. 52—584 10 Claims

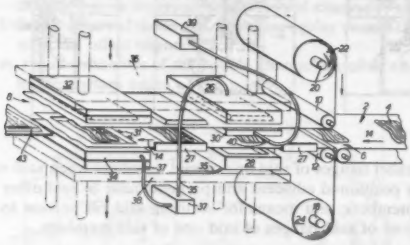


1. Wall panel structure and connecting means comprising:
a. a generally rectangular panel having spaced parallel side walls, top and bottom edge walls and opposite end elements;
b. said edge walls being arranged to have interfitting engagement with edge walls of other similar panels disposed in edge wall abutting engagement with said panel;
c. said end elements each having opposite ends disposed adjacent respective ones of said edge walls;
d. each end element including a pair of flat sides the planes of which are angularly displaced from each other and from the planes of said side walls;
e. the sides of each end element having aligned slots extending longitudinally inwardly toward each other from said opposite ends of said end elements;
f. and tubular connectors for holding said end elements in end-to-end aligned relationship with the end elements of other similar panels when disposed in edge wall to edge wall abutting engagement with said panel;
g. each connector having pairs of aligned slots, the slots of each pair extending longitudinally inwardly toward each other from opposite ends of said connector and spaced apart from the slots of other pairs thereof about the periphery of said connector;
h. the slots in said end element sides and said connector each being arranged to receive portions of said connector and said end element sides, respectively, longitudinally inwardly of the slots thereof.

4,008,554
PACKAGING MACHINES AND METHODS OF PACKAGING ARTICLES

Peter D. Hardy, Welwyn Garden City, England, assignor to The Metal Box Limited, Reading, England

Filed Oct. 7, 1975, Ser. No. 620,268
Claims priority, application United Kingdom, Oct. 12, 1974, 44298/74
Int. Cl.² B65B *47/10*
U.S. Cl. 53—30 R **13 Claims**



1. A method of producing packs, comprising the steps of
supporting a sheet of inelastically stretchable packing material generally horizontally,
locating the intended contents of the packs in succession on the sheet,
clamping the sheet peripherally of each region of the sheet material which supports the intended contents,
applying differential pressure to each region to inelastically stretch the sheet in the downward direction to form an upwardly open pocket holding the said contents,
superimposing a further sheet of material upon the first-mentioned sheet material to close the pocket, and
bonding the further sheet to the first mentioned sheet of material peripherally of the said region to form a said pack.

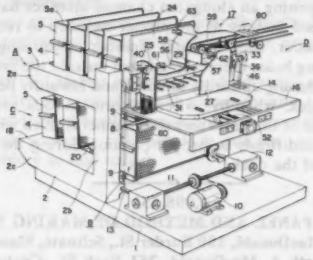
4. A packaging machine for forming packs, comprising
first guide means arranged for guiding a first web of a plastics or cellulosic material along a generally horizontal path from an inlet to an outlet,
means for feeding the intended contents of said packs to said inlet onto successive regions of the upper surface of the web for transport along said path in longitudinally spaced relation,
web clamping means mounted to clamp the web peripherally of the regions,
web forming means mounted in relation to the web clamping means to stretch the clamped web inelastically in the downward direction by differential pressure with the intended contents thereon and thereby form upwardly open pockets having the intended contents received therein,
second guide means to guide a second web of material over the first web, after the said stretching thereof, and
sealing means effective upon the superimposed webs to seal the webs together peripherally of, and to close, the pockets.

4,008,555
APPARATUS FOR PILING ROD-SHAPED ARTICLES IN A CONTAINER

Koh Ainoya; Kiichi Arai, both of Tokyo; Akira Kato, Sanjyo, and Michio Tanaka, Niigata, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation; Neo Filter Co., Ltd., both of Tokyo and Sanjo Machine Works Ltd., Minami-kanbara, all of, Japan

Filed Aug. 11, 1975, Ser. No. 603,602
Claims priority, application Japan, Aug. 20, 1974, 49-094640
Int. Cl.² B65B *19/04*, *19/12*
U.S. Cl. 53—148 **11 Claims**

1. In an apparatus for piling up rod-shaped articles within a hopper means so that the articles are maintained in an orderly pile having a honeycombed configuration, the hopper means including a bottom wall and a pair of upwardly projecting sidewalls between which said pile of articles is formed, means for supporting a container means disposed adjacent and vertically movable relative to said hopper means for receiving therein the articles which are piled within the hopper means, pushing means for transferring at least the lowermost row of articles from said hopper means into said container means, said pushing means including a pushing element movable transversely across the bottom wall for displacing at least the lowermost row of articles from said hopper means into said container means, and leveling means associated with the hopper means for distributing and leveling the rod-shaped articles within the hopper means, comprising the improvement wherein said hopper means includes adjusting means associated therewith for maintaining the lowermost rows of articles in an orderly pile after they have moved downwardly in the hopper means due to the lowermost row of articles being

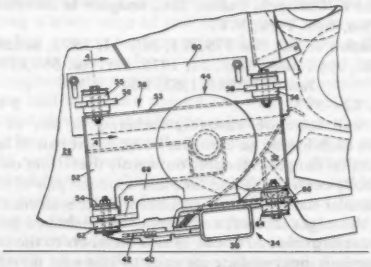


pushed into said container means, said adjusting means including a pair of movable members provided adjacent the lower part of the hopper means and movable between an inner position wherein they protrude inwardly from the sidewalls of the hopper means and an outer position wherein they are spaced outwardly from said inner position, said movable members being engageable with the lowermost rows of articles within said pile when said members are in said inner position for holding said lowermost rows in an orderly fashion, means for moving said members between said inner and outer positions in a selected relationship with respect to the movement of said pusher means, said members being movable in a direction which is substantially perpendicular to the direction of movement of said lowermost row when it is displaced by said pusher means, said movable members having a nonlinear surface profile which extends in the vertical direction of the hopper means and defines adjacent projection means and recess means disposed for cooperation with a pair of vertically adjacent rows as disposed adjacent the bottom of said pile.

4,008,556
ISOLATED HARVESTER CUTTER BAR

Edmund Lawrence Wegscheid, Milan, Ill., and Larry Wilson Cofer, Drakesville, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 19, 1976, Ser. No. 659,574
Int. Cl.² A01D *49/00*
U.S. Cl. 56—12.6 **12 Claims**



1. In a harvesting machine having a mobile frame including a subframe with opposite lateral sides, the combination there-

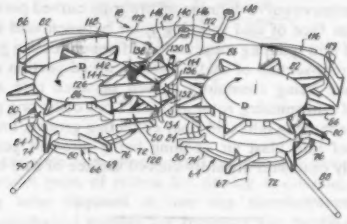
with of an improved cutting apparatus and means for mounting the apparatus on the frame comprising: a cutter bar assembly extending between the opposite frame sides and including a transverse support member and a laterally reciprocating cutting element mounted on the support member and operative to sever crop material from the field as the machine advances; a pair of resilient mounting means operatively connecting the opposite ends of the cutter bar assembly to the opposite frame sides to at least partially isolate vibration of the cutter bar assembly from the frame; and drive means drivingly connected to the cutting element for reciprocating said cutting element.

4,008,557

TOPPING MECHANISM FOR SUGAR CANE HARVESTERS

Keith Ruback, and Rolf Haines, both of Bundaberg, Australia, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Oct. 10, 1975, Ser. No. 621,273
Int. Cl.² A01D *45/02*
U.S. Cl. 56—63 **10 Claims**



1. A topping mechanism for a sugar cane harvester including a main frame, attachment means on the main frame for attaching the topping mechanism to a sugar cane harvester, a right hand arm extending generally forward from the main frame, a left hand arm extending generally forward from the main frame, a right hand cutter mounted on the right hand arm for rotation about a generally vertical axis, a left hand cutter mounted on the left hand arm for rotation about a generally vertical axis, drive means for both cutters which drive the cutters in opposite directions so that adjacent portions of the two cutters move in a direction to pass sugar cane therebetween, a deflector member pivotally mounted on the main frame between the right hand arm and the left hand arm for deflecting sugar cane toward the right hand cutter, or for deflecting sugar cane toward the left hand cutter, and sugar cane gathering means for directing sugar cane toward the deflector member and the cutters.

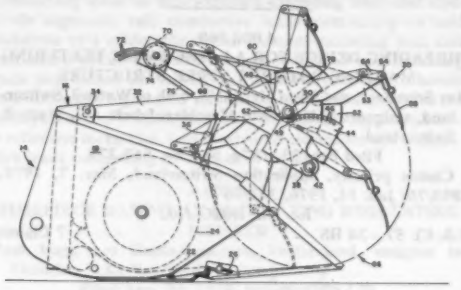
4,008,558

ADJUSTABLE REEL FOR A HARVESTER PLATFORM

Roger Eugene Mott, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 2, 1975, Ser. No. 592,785
Int. Cl.² A01D *57/02*
U.S. Cl. 56—226 **10 Claims**

1. A pickup reel for a transversely elongated harvesting platform having opposite sides comprising; a reel supporting structure mounted on the platform and including a pair of support elements respectively disposed at the opposite platform sides; a pair of adjustable elements respectively mounted on the support elements by coaxial transverse pivot means; locking means operative between the support elements and the adjustable elements for selectively locking the adjustable elements in alternate angular positions about said pivot means; a transverse shaft means rotatably supported on and extending between the adjustable elements axially parallel to the pivot means; a plurality of radial members mounted on the shaft means; a plurality of axially transverse rockshafts journaled on the radial members equally offset and parallel to the shaft means axis and substantially spanning the width of the platform; a plurality of radial fingers mounted on each rockshaft and having outer tips; an eccentric rockshaft actuating means rotatably mounted on the adjustable elements axially



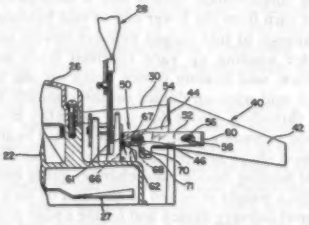
parallel to the shaft means the pivot means and operatively connected to the rockshafts to rock the rockshaft as the reel rotates so that the fingers maintain a relatively constant attitude relative to the ground, with the fingertips generating a cylinder that is generally coaxial with the pivot means, whereby changing the position of the adjustable elements changes the attitude of the fingers relative to the ground while maintaining a relatively constant position of the cylinder generated by the fingertips.

4,008,559

SAFETY DEFLECTOR ASSEMBLY FOR POWER LAWN DISCHARGE CHUTE

William Ralph Lessig, III, and Allen George Beares, both of Towson, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Feb. 26, 1974, Ser. No. 445,872
Int. Cl.² A01D *75/20*
U.S. Cl. 56—320.2 **8 Claims**



1. A safety deflector assembly for a power lawn mower including a mower body provided with a discharge chute, comprising:

a deflector including an arm extending from one edge thereof;

a first pin for pivotally connecting said arm to the mower body to support said deflector for pivotal movement between a guard position located in the path of movement of material discharged from the discharge chute to deflect the material toward the ground and an unguard position out of the path of movement of the discharged material;

a second pin mounted on said arm and spaced from said first pin;

a lever including first and second spaced elongated slots for receiving said first and second pins, respectively, to slid-

ably support said lever on said arm for movement between a latching position in engagement with a stop on the mower body to latch said deflector in its guard position and a non-latching position out of engagement with the stop to allow said deflector to pivot from its guard position to its unguard position; and

means normally biasing said deflector to its guard position and said lever to its latching position.

4,008,560

THREADING DEVICE FOR A FALSE-TWIST TEXTURING MACHINE WITHOUT UPPER STRUCTURE

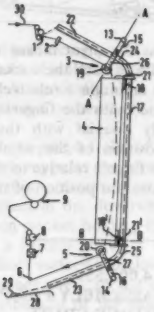
Max Schnetzer, and Risto Merimaki, both of Wattwil, Switzerland, assignors to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed Feb. 23, 1976, Ser. No. 660,279

Claims priority, application Switzerland, Mar. 7, 1975, 2893/75; Jan. 14, 1976, 362/76

Int. Cl.² D02G *1/02*

U.S. Cl. 57—34 HS **7 Claims**



1. In a false-twist texturing machine having an assembly comprising a vertically extending contact heating device for yarn travelling downwards therealong, a yarn input delivery device and first thread-guide means for delivering yarn to the upper end of said heating device, a yarn output delivery device, second thread-guide means and a false-twist imparter arranged for yarn from the lower end of said heating device to pass therethrough to said output delivery device and a wind-up device for winding up yarn received from said output delivery device, said heating device being on one side of the machine and said wind-up device on the opposite side of the machine; a threading device for said assembly comprising a channel guide extending along one side of said heating device from a location above said heating device to a second location beneath said heating device, said channel guide being shaped as a guide for a weight attached to one end of yarn extending from said input delivery device and falling under gravity therethrough to said second location, and said channel guide having its open side constituted by a slot presented towards said heating device and towards said first and second thread-guide means whereby the yarn can pass into contact with said heating device and said first and second thread-guide means after being drawn through said channel guide by the weight.

4,008,561

OPEN-END SPINNING DEVICE

Gerhard Grau, Albershausen, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Germany

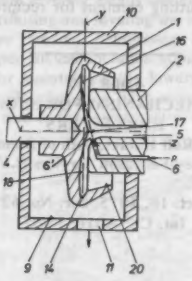
Filed Oct. 11, 1974, Ser. No. 514,086

Claims priority, application Germany, Oct. 11, 1973, 2351092

Int. Cl.² D01H *1/12, 1/00*

U.S. Cl. 57—56 **8 Claims**

1. In an open-end spinning device which includes a spinning rotor having an axis of rotation, a bottom face, a lateral sliding face conically widening toward the bottom face and intended for receiving fibers which have been fed into the spinning rotor and a fiber collecting groove located between the bottom face and the sliding face; and a blast air opening means having an axis disposed on a stationary part of the spinning device adjacent to an inner chamber of the spinning rotor for blowing fibers and foreign bodies from the fiber collecting groove to clean the same, the improvement comprising a



shallow, concave curve defining an inwardly curved portion of said bottom face of said spinning rotor between said axis of rotation of said spinning rotor and said fiber collecting groove, with the cross-section of said inwardly curved portion of said bottom face being constantly curved between said axis of rotation of said spinning rotor and said fiber collecting groove gradually changing into said fiber collecting groove, and with said axis of said blast air opening being directed generally tangentially onto said inwardly curved surface of said bottom face.

4,008,562

APPARATUS FOR SUPPLYING A STAPLE FIBER FORMATION TO A FIBER SEPARATING DEVICE OF AN OPEN-END SPINNING UNIT

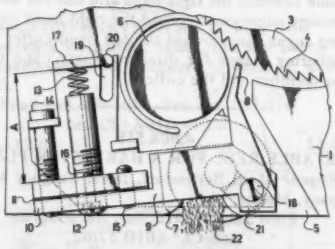
Milos Vecera; Josef Skala, and Oldrich Tesar, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed June 12, 1975, Ser. No. 586,400

Claims priority, application Czechoslovakia, June 18, 1974, 4276/74

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.95 **2 Claims**



1. In an open-end spinning unit comprising an apparatus for supplying a staple fiber formation to a fiber separating device having a rotatable combing-out cylinder adapted to cooperate with a feed roller and with a pressure shoe mounted on a pivot shaft of said apparatus and biased toward said feed roller, the improvement which comprises, a swingably arranged link mounted on said pivot shaft, said pivot shaft being eccentric, the link being provided with a cutout and stop means, a stationary guide member on said apparatus adapted to be re-

ceived in the cutout thereby guiding and limiting the swingable movement of said link about said pivot shaft, an arm pivotally mounted on the pivot shaft and carrying the pressure shoe, and stop members mounted on said arm and coacting with said stop means on said link to limit the movement and bias of said pressure shoe relative to said feed roller and said combing-out cylinder.

4,008,563

FALSE TWISTING DEVICE

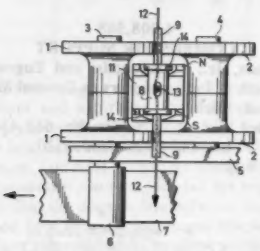
Hans Gassner, Schweinfurt, and Manfred Kress, Grafenrheinfeld, both of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed June 17, 1975, Ser. No. 587,596

Claims priority, application Germany, June 20, 1974, 2429493

Int. Cl.² D02G *1/06*; D01H *1/12*, *1/20*

U.S. Cl. 57—77.45 **4 Claims**



1. In an open end spinning or false twisting device having two parallel pairs of rollers for driving a spinning rotor or twisting tube disposed in the nip therebetween and a horseshoe-shaped magnet for retaining the twisting tube or rotor in the nip, said twisting tube or rotor having a pair of longitudinally spaced collars, the improvement wherein said magnet has north and south longitudinally spaced poles having a curved surface each disposed substantially concentrically about one of said collars over more than one-half of the periphery of the collar, at least one pole of the magnet having at least its surface facing in the direction in which the twisting tube or rotor tends to be displaced from its position by the pull of a thread passing axially therethrough beveled whereby upon axial displacement of the tube or rotor each collar still lies opposite the magnet at least at the base of its said curved surface.

4,008,564

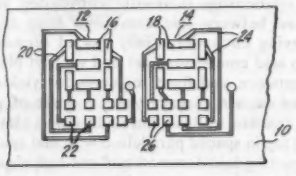
LIQUID CRYSTAL DISPLAY DEVICE

Nunzio A. Luce, 39 Galston Drive, R.D. No. 4, Trenton, N.J. 08691, and Louis A. Zanoni, 13 Greentree Road, Mercerville, N.J. 08619

Filed June 9, 1972, Ser. No. 261,252

Int. Cl.² G04C *3/00*; G04B *19/06*; G02F *1/13*

U.S. Cl. 58—23 R **3 Claims**



1. A digital electronic watch comprises a liquid crystal display cell, a power supply, an oscillator and associated circuit elements, interconnected for operating said watch, including circuit elements for performing functions of dividing, counting, decoding, and increasing voltage, said liquid crystal display cell of said watch comprises a substrate having thin film segmented electrodes thereon forming numeric character patterns, a support plate having an electrode coating thereon spaced from said substrate by spacer means, an electro-optically active liquid crystal composition in said space between said electrodes of said substrate and support plate, thin film conducting leads on said substrate extending from said electrode segments, said conductive leads terminating on said substrate at a solderable circuit element mounting pad, said associated circuit elements being mounted on said mounting pads and means for sealing said liquid crystal cell, wherein said substrate, segmented electrodes and conductive leads are transparent and wherein said electrode on said support plate is a reflective metal film, said segmented electrodes and conductive leads comprising an indium oxide film.

4,008,565

TIMEPIECE HAVING AN OSCILLATING REGULATING MEMBER

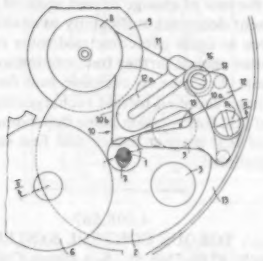
Paul Vogt, Les Hauts-Geneveys, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Aug. 20, 1975, Ser. No. 606,120

Claims priority, application Switzerland, Sept. 6, 1974, 12130/74.

Int. Cl.² G04B *15/14*; G04C *3/04*

U.S. Cl. 58—28 D **4 Claims**



1. A timepiece having a frame and having an oscillating regulating member, the oscillations of which are counted by means of a click counting mechanism including a ratchet wheel submitted to the action of a driving pawl and a retaining pawl, said click counting mechanism comprising:

two metallic blades constituting respectively said driving pawl and said retaining pawl,

said driving blade being bent at substantially a right angle forming two portions with an elbow therebetween and being secured to said frame by an end of one of its portions and cooperating by the opposite end of said portion, substantially at said elbow, with said oscillating regulating member, which member imparts a back and forth movement to said driving blade, a free end of the second portion of said driving blade cooperating with said ratchet wheel.

4,008,566

ELECTRONIC WATCH GENERATOR

Richard D. McClintock, 237 Washington Road, Woodbury, Conn. 06798

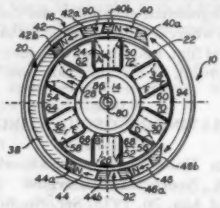
Filed Nov. 10, 1975, Ser. No. 630,200

Int. Cl.² G04B *19/30*; H01M *10/46*

U.S. Cl. 58—50 R **17 Claims**

1. An electronic timepiece having an electronically operated time display and a rechargeable storage means operatively connected to said display for supplying electrical power thereto, said timepiece comprising a stator comprised of a magnetically permeable material, said stator having a first coil of electrically conductive material disposed about said mag-

netically permeable material; a rotor rotatably mounted in said timepiece for free rotation about said stator, said rotor having a variable angle of inclination and comprising a pendulum having an offset weight distributed therein and a first magnet mounted therein for adjacent relative movement past said first stator coil during said free rotation of said rotor for inducing a voltage in said first stator coil as a result of said relative movement; and means operatively connecting said first stator coil to said rechargeable storage means for recharging said rechargeable storage means from said induced voltage; said first magnet magnetically latching said rotor against said free rotation with respect to said stator with a predetermined magnetic latching force until said rotor angle of inclination is varied sufficiently from an initial position to enable gravity to initially overcome said magnetic latching force whereupon said rotor freely rotates about said stator from its initial magnetically latched position with an initial acceleration due to the rate of change of said angle of inclination until said movement decreases sufficiently to enable said magnetic latching force to again overcome said rotor and magnetically latch said rotor against further free rotation until said latching force is again overcome to reenable said free rotation, said induced voltage supplied to said rechargeable storage means as a result of said free rotation being dependent on the number of times said first magnet passes said first stator coil during said free rotation.

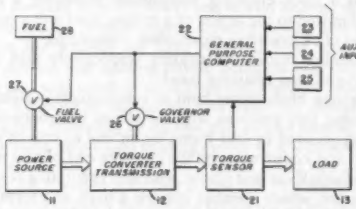


4,008,567

TORQUE CONTROL SYSTEM

Joseph Hirsch, 4746 59th St., San Diego, Calif. 92115

Filed Apr. 28, 1975, Ser. No. 572,236
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.28 P **13 Claims**



1. A torque control system for effecting maximum economic utilization of motive energy comprising:

a source of rotary motive power;

operating means connected to said source of rotary motive power for selectively altering the operational characteristics thereof;

load means having a rotary mechanical input for utilizing the rotary motive power supplied by said source of rotary motive power;

transmission means connected between said source of rotary motive power and said load means for transferring the rotary motive power therebetween thereby establishing a rotary torque drive system for said load means;

electromechanical, torque responsive transducer means attached to said load means at the rotary mechanical input thereof so as to be between said transmission means and said load means for producing an electrical analog of the torque applied thereto;

a source of electrical energy corresponding to the electrical analog signal representing the torque at a predetermined operational condition;

an electrical circuit means connected to said electromechanical, torque-responsive transducer and to said source of electrical energy for comparison thereof for the generation of a control signal in response thereto; and

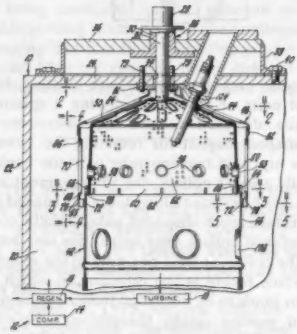
electrical drive means connected to said electrical circuit means to receive said control signal therefrom and connected to said operating means for controlling the application of torque by the torque drive system in response to said control signal, whereby a predetermined torque may be applied to said load means.

4,008,568

COMBUSTOR SUPPORT

Esten W. Spears, Jr., Indianapolis, and Eugene R. Young, Plainfield, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,434
Int. Cl.² F02C *3/00, 7/20*
U.S. Cl. 60—39.32 **2 Claims**

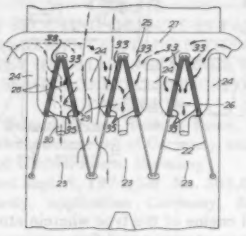


1. A combustor support assembly for vertically supporting axially aligned combustor dome and liner segments on nozzle support pad comprising a spider support member having a top flange at one end thereof with a central opening adapted to receive a fuel distribution nozzle and a peripheral flange of the other end thereof, means on said top flange for fixedly securing it to the nozzle support pad, said spider support member having a plurality of circumferentially spaced radially outwardly formed spider arms extending from said top flange to said peripheral flange, an annular support plate having opposite ends thereon with one end thereof secured to said peripheral flange, a combustor liner having one end telescoped into the opposite end of said support plate in radially inward spaced relationship therewith, convoluted spacer elements interposed between said combustor liner and said support plate having circumferentially spaced segments thereon secured to said combustor liner and support plate and flex segments between said fixed segments for yieldably supporting said liner on said support plate, a dome of porous material located concentrically within said support plate and having an inclined top in spaced parallelism with said spider arms, means for supporting said dome on said one end of said liner for free axial and radial movement with respect to said spider support plate with said spider support plate assuming the full vertical weight of said liner and dome and said dome being unloaded vertically to reduce stress loading thereof.

4,008,569
GAS TURBINE ENGINE

Harry Wrighton Bennett, Duffield, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Nov. 24, 1975, Ser. No. 634,754
Claims priority, application United Kingdom, Dec. 3, 1974, 52181/74
Int. Cl.² F02C 7/10; F23L 15/02
U.S. Cl. 60—39.51 H 8 Claims

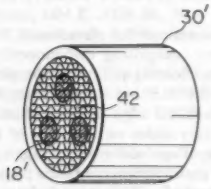


1. A gas turbine engine comprising a compressor, combustion equipment and a turbine, the compressor and turbine being drivingly interconnected, and a heat exchanger adapted to exchange heat between the compressor delivery air and the turbine exhaust, said heat exchanger comprising a plurality of rotatable regenerator discs whose axes are angled in alternate directions so that the discs define between them a plurality of wedge-shaped flow areas, drive means adapted to rotate the discs, first duct means adapted to allow turbine exhaust gases to flow into a first set of said flow areas, through at least part of each disc and through a second set of said flow areas, an exhaust nozzle connected to receive the turbine exhaust gases flowing through said second set of flow areas, and second duct means adapted to direct compressor delivery air to flow in contra-flow to, and separated from, the turbine exhaust gas through a segment of each disc and to said combustion equipment.

4,008,570
METHOD AND APPARATUS FOR PURIFYING EXHAUST GASES

Masanori Harada, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 368,487, June 11, 1973, abandoned.
This application Apr. 8, 1975, Ser. No. 566,131
Int. Cl.² F01N 3/15
U.S. Cl. 60—299 5 Claims

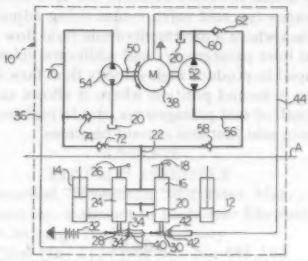


1. An apparatus for purifying exhaust gases discharged from an internal combustion engine having an exhaust manifold, comprising:
an exhaust gas pipe leading from said exhaust manifold to the atmosphere;
a catalytic converter disposed in said exhaust gas pipe at a certain distance from the engine, said catalytic converter including a monolithic ceramic honeycomb cylinder which is formed with a thin wall structure and has a upstream end and a downstream end, said honeycomb cylinder being separated into a catalytic portion which is formed with a plurality of thin walls carrying a catalytic material and a passage portion other than said catalytic portion which is formed with a plurality of thin walls carrying no catalytic material and integral with the thin walls of said catalytic portion, said catalytic portion extending through said honeycomb cylinder from the upstream to downstream ends thereof and serves as a catalytic reactor, said passage portion extending through said honeycomb cylinder from the upstream to downstream ends thereof and serving as a mere passage for allowing the exhaust gases to pass through said honeycomb cylinder; and
a thermal reactor disposed in said exhaust pipe downstream of said catalytic converter.

4,008,571
HYDRAULIC SYSTEM FOR ELECTRIC LIFT TRUCKS

Dafydd Williams Evans, Euclid, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Mar. 31, 1976, Ser. No. 672,371
Int. Cl.² F15B 13/09
U.S. Cl. 60—423 11 Claims



1. An energy conserving hydraulic system, comprising:
a hydraulic, work performing mechanism of the type having varying load requirements;
valve means for controlling said mechanism;
a first high volume hydraulic pump;
a second low volume hydraulic pump;
a reversible, bidirectional prime mover for simultaneously driving both said pumps;
conduit means connecting said pumps to said valve means such that for one direction of drive of said prime mover, said first pump will deliver a high volume of hydraulic fluid to said valve means and for the other direction of drive said first pump will be unloaded and said second pump will deliver a low volume of hydraulic fluid to said valve means; and
means for selecting the direction of drive of said prime mover.

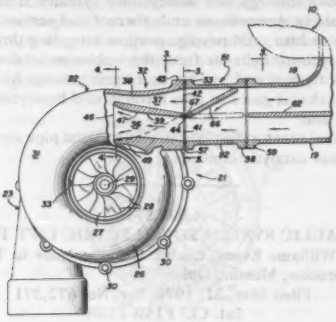
4,008,572
TURBINE HOUSING

William E. Woollenweber, Jr., Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 25, 1975, Ser. No. 552,861
The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.
Int. Cl.² F02D 23/00
U.S. Cl. 60—602 15 Claims

1. A turbine housing for a centripetal flow turbine used with a driving fluid source which supplies varying volumes of said driving fluid, comprising means forming a first inlet passageway for receiving said fluid flow, a volute section formed from said first inlet passageway for discharging said fluid flow, means forming an additional inlet passageway for receiving

said fluid flow and defining an outlet for directing said fluid flow in a direction which is substantially parallel to the direction of flow through said first inlet passageway, said additional inlet passageway being contained within said first inlet passageway and being at least partially surrounded by said first inlet passageway as viewed in a plane generally normal with respect to the flow through said additional inlet passageway,



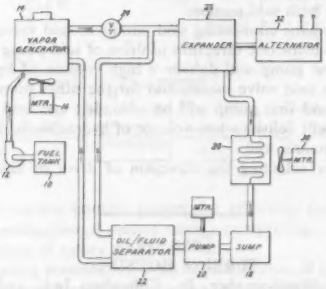
and valve means mounted adjacent the upstream ends of said inlet passageways, said valve means being adjustable from a first position where it directs all of said fluid flow through said additional inlet passageway, said additional inlet passageway being shaped to produce high velocity fluid flow in said volute section, to a second position where it allows said fluid flow through both of said passageways, and to positions intermediate between said first and second positions.

4,008,573

MOTIVE FLUIDS FOR EXTERNAL COMBUSTION ENGINES

Vincent Carmen Petrillo, Springfield, Pa., assignor to General Electric Company, Fairfield, Conn.

Filed Dec. 9, 1975, Ser. No. 639,241
Int. Cl.² F01K *25/08*
U.S. Cl. 60—651 **2 Claims**



1. A method of converting heat energy to mechanical energy comprising:

vaporizing a fluid by passing it in heat exchange relationship with a heat source,

said fluid comprising in parts by volume:

ethyl alcohol: 45 to 45.5%

distilled water: 45 to 45.5%

pyridine: 9 to 10%

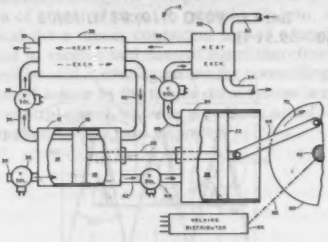
utilizing the energy of the vaporized fluid to perform work.

4,008,574

POWER PLANT WITH AIR WORKING FLUID

Charles R. Rein, 103 Carolyn Ave., Panama City, Fla. 32401

Filed Oct. 20, 1975, Ser. No. 623,880
Int. Cl.² F02G *1/02*
U.S. Cl. 60—682 **8 Claims**



7. A thermal engine of the type wherein atmospheric air is inspired at first temperature and first pressure into a variable volume first chamber, displaced from the first chamber through a heat exchanger at a constant volume to a second variable volume second chamber at an elevated second temperature and elevated pressure, expanded to perform work in a variable volume third chamber, and exhausted from said third chamber as spent working fluid at an intermediate third temperature with respect to said first and said elevated second temperatures, said engine being characterized by the improvement comprising:

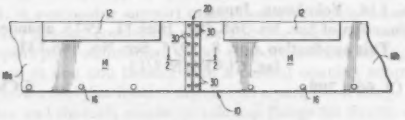
heat input means, connected between said third chamber and said heat exchanger, for adding heat to said spent working fluid to provide a heating fluid medium to said heat exchanger at a fourth temperature above said elevated second temperature.

4,008,575

LIGHTWEIGHT END CONNECTORS FOR POLLUTION CONTAINMENT BOOM

John J. Gallagher, 171 Williams Drive, Annapolis, Md. 21401

Filed Apr. 16, 1975, Ser. No. 568,678
Int. Cl.² E02B *3/00*
U.S. Cl. 61—1 F **3 Claims**



1. A fluid-tight connector for elements of floating pollution containment booms comprising disconnectible elements including at least one floating pollution containment boom, at least one of the elements being secured along substantially the entire extent of a vertical edge of said pollution containment boom, complimentary slides on the ends of each of the elements, at least one of said slides including:

a pair of flanges parallelplanar with the plane of and extending from the end of said element to form a groove therebetween; and

transverse members on the free ends of said flanges, said transverse members having rearward faces on each side thereof disposed to form an angle of less than 90° with the plane of said element and to partially close the opening in the groove formed by said flanges,

said flanges being of a thicknss substantially equal to the width of said opening,

said transverse members and flanges forming tongues which, when inserted into the groove of a corresponding

slide, are configured to form a fluid-tight connection between elements, and said transverse members and flanges including means to direct resultant transverse forces imposed on the flanges forming the groove inwardly through reaction on the abutting rearward faces and to block withdrawal of said tongue from said groove in directions other than parallel to said groove.

4,008,576

METHOD OF SECURING OBJECTS IN PASSAGES AND ARRANGEMENT OBTAINED THEREBY, PARTICULARLY HOSE LINES SEALINGLY SECURED IN THE PASSAGES OF COAL MINES FOR DUST SUPPRESSION

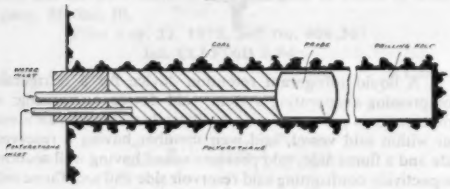
Frank Meyer; Helmut Becker, both of Essen, and Heinz Goretz, Gelsenkirchen-Buer, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Sept. 9, 1974, Ser. No. 503,899

Claims priority, application Germany, Sept. 8, 1973, 2345393

Int. Cl.² E21C *35/22*

U.S. Cl. 61—36 R **26 Claims**



1. A method of securing liquid-conveying elements for dust suppression in mines, comprising forming an underground passage which opens to a source of dust in a mine; positioning a liquid- conveying element in such a manner that said element extends along said passage and is arranged to permit impingement of said dust source by a stream of liquid to thereby wet said dust source and suppress the escape of dust therefrom, said element defining a clearance space with the inner wall of said passage; admitting into said space a hardenable synthetic resin which is in flowable state; hardening said resin in said space to thereby secure said element in said passage; and connecting said element with a source of liquid.

4,008,577

CUT AND COVER CONSTRUCTION OF SUBWAY WITH UTILITY CHAMBER AND AIR CONDITIONING WITH MINIMUM STREET TRAFFIC DISTURBANCE

Sidney H. Bingham, 109 E. 35th St., New York, N.Y. 10016, and William H. Eberhardt, 3 Wheatley Ave., East Williston, N.Y. 11596

Division of Ser. No. 519,254, Oct. 31, 1974, Pat. No. 3,914,916. This application Mar. 5, 1975, Ser. No. 553,793

Int. Cl.² E01G *4/02;* **E02D** *5/00*

U.S. Cl. 61—44 **3 Claims**

1. An underground subway having longitudinal edges and an exposed finished roadway, comprising:

a plurality of spaced apart soldier beams embedded underground along each of said edges, the soldier beams of the respective pluralities being oppositely located;

concrete walls partially embedding each plurality of soldier beams to define said edges;

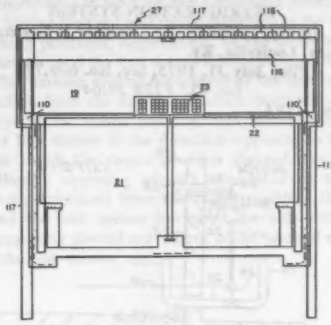
said walls bounding a utility chamber;

a train tunnel beneath said utility chamber;

air penetrable flooring for the utility chamber separating the chamber from the train tunnel to support utilities and accommodate air conditioning;

transverse decking beams supported by the oppositely disposed soldier beams; and,

precast concrete ribbed arch concrete ribbed arch decking



carried by said decking beams to support said finished roadway.

4,008,578

PIT PROP ASSEMBLY

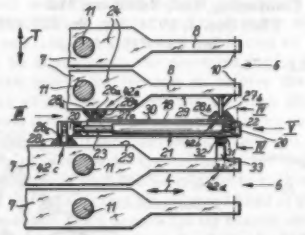
Günter Blumenthal, Westerholt, and Peter Marr, Bochum, both of Germany, assignors to Bochumer Eisenhutte Heintzmann & Company, Bochum, Germany

Filed May 11, 1976, Ser. No. 685,162

Claims priority, application Germany, May 17, 1975, 2522111

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **10 Claims**



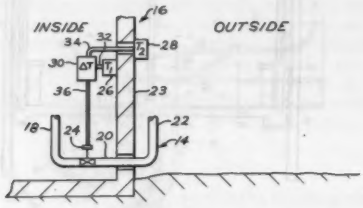
1. A pit prop assembly for use in a mine having a floor, a roof, and a face, said assembly comprising: a pair of pit props having parallel elongated floor-engaging bases each with a front end adapted to be turned toward said face and a rear end turned away from said face and spaced in the longitudinal direction of the respective base from the respective front end, a roof-engaging arm pivoted on each of said bases at the respective rear end thereof, and means between each of said arms and the respective base for pressing the respective arm against said roof; a longitudinal hydraulic ram extending in said direction and having one end operatively connected to one of said bases and another end operatively connected to the other of said bases, whereby longitudinal contraction or extension of said ram displaces said bases relative to each other in said direction; and means including an element of variable length between said bases for varying the spacing transverse to said direction therebetween.

4,008,579

APPARATUS FOR HEAT CONTROL OF A REFRIGERATION SYSTEM

Julius B. Horvay, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 31, 1975, Ser. No. 600,772
Int. Cl.² F25B *39/04*
U.S. Cl. 62—183 **5 Claims**



1. Apparatus for controlling the temperature of a refrigeration system of a refrigerator positioned within a house, said apparatus comprising:

a heat pipe of general U configuration having middle and first and second leg portions, said first leg portion being in heat exchange relationship with the refrigeration system, said middle portion passing through a wall of the house, and said second leg portion being outside the house for passing heat from the refrigeration system to a location outside the house;

a control valve positioned between said first and second heat pipe leg portions for controllably isolating said first leg portion from said second leg portion; and

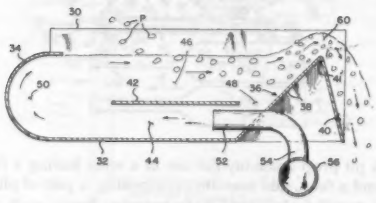
means for moving the control valve between an open and a closed position in response to the difference between the temperatures outside and inside the house.

4,008,580

INITIAL QUICK FREEZE PAN FOR DIRECT REFRIGERANT CONTACT COOLER

Gerald James Heber, Bellevue, and Daniel Arthur George Roxburgh, Redmond, both of Wash., assignors to Frigoscandia Contracting, Inc., Baltimore, Md.

Filed Dec. 4, 1974, Ser. No. 529,487
Int. Cl.² F25D *17/02*
U.S. Cl. 62—376 **19 Claims**



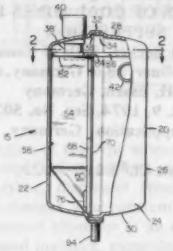
1. In combination with a cooler for extracting heat from articles by directly contacting the articles with a liquid freezant, an initial quick freeze pan in communication with the cooler interior and having an inlet and an outlet, and means forming three serially arranged interconnected channels providing a continuously recirculating freezant flow path with entrained back flow in which articles are contacted directly with liquid freezant, the first channel communicating with said inlet for directing freezant in a reverse direction, the second channel communicting with said outlet for directing freezant in a forward direction opposite said reverse direction, the intermediate channel interconnecting adjacent ends of said first and second channels and having a configuration adapted for progressively turning freezant from said reverse direction to said forward direction, the other ends of said first and second channels communicating for direct continuous recirculation of liquid freezant from said second channel to said first channel.

4,008,581

SUCTION ACCUMULATOR

Sharon J. Hudson, Jr., Toledo, Ohio, assignor to Sharon Manufacturing Company, Toledo, Ohio

Filed July 21, 1975, Ser. No. 597,585
Int. Cl.² F25B *43/00*
U.S. Cl. 62—503 **20 Claims**



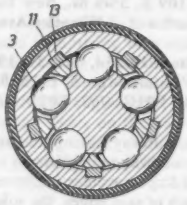
1. A liquid refrigerant retention device for a refrigerant compressing-evaporating system, said device comprising: in combination a pressure vessel, a vertically disposed weir member within said vessel, said weir member having a reservoir side and a flume side, said pressure vessel having wall sections respectively confronting said reservoir side and said flume side of said weir member, said weir member forming a reservoir with the confronting vessel wall section on the reservoir side of said weir member and an outlet flume with the confronting vessel wall section on the flume side of said weir member, a liquid metering aperture through the bottom of said weir member from the reservoir to the flume, a fluid inlet to the vessel on the reservoir side of said weir member and a fluid outlet from the vessel on the flume side of said weir member.

4,008,582

CONSTANT VELOCITY UNIVERSAL JOINT

Hans-Heinrich Welschof, Rodenbach, Germany, assignor to Lohr & Bromkamp GmbH, Offenbach (Main), Germany

Filed June 2, 1975, Ser. No. 582,815
Claims priority, application Germany, June 22, 1974, 2430027
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **9 Claims**



1. A constant velocity torque transmitting universal joint comprising an outer joint member having a cylindrical bore therethrough and a plurality of grooves in the surface of said bore, an inner joint member within said bore and having a corresponding plurality of grooves in the outer surface thereof opposing said outer joint member grooves, means jointly received in each pair of opposed inner and outer grooves for transmitting torque therebetween, a cage between said joint

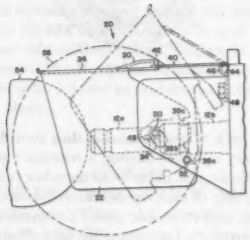
members and having a plurality of openings therein spaced to correspond with said pairs of opposed grooves to dispose the centers of said torque transmitting means in a plane perpendicular to the axis of the cage, said cage having a first spherical surface on its outer face and a second spherical surface on its inner face, means on the outer surface of said inner joint member coacting with said cage second spherical surface for guiding said cage with respect to said inner joint member, the centers of said first and second cage spherical surfaces being equidistant on opposite sides of said plant passing through the centers of said torque transmitting means, there being axially extending second grooves in the surface of said outer joint member bore and a said second groove disposed between two adjacent torque transmitting means grooves in said bore surface, keys within said second grooves engaging the outer spherical surface of said cage to guide said cage, and means for restraining said key to one of no axial displacement or limited axial displacement.

4,008,583

SWINGABLE SHIELD ASSEMBLY FOR TRACTOR POWER TAKE-OFF

Lewis Kie Davis, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 21, 1975, Ser. No. 606,361
Int. Cl.² F16D *3/84*
U.S. Cl. 64—32 R **8 Claims**



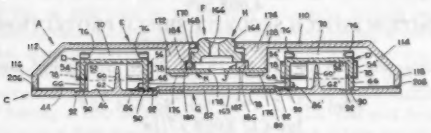
1. A PTO shield assembly for a tractor having a PTO shaft protruding therefrom, comprising: an inverted, U-shaped, shield member extending above and to the sides of the PTO shaft and secured to the tractor for pivotation about a horizontal axis perpendicular to the axis of the PTO shaft; said shield member having orientation means provided therein for establishing a plurality of pivotable positions for the shield member; and holding means on the tractor engageable with the orientation means for holding the shield member pivoted in one of the plurality of pivotable positions.

4,008,584

DRAW BOLT

Rudolf Wingert, High Crest Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed Jan. 7, 1975, Ser. No. 539,076
Int. Cl.² E05B *65/48*
U.S. Cl. 70—73 **11 Claims**



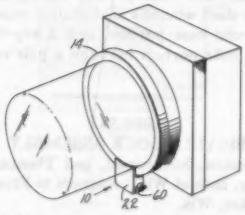
1. A draw bolt cooperable with an associated hasp, the draw bolt comprising a frame; link means having one end thereof pivotally connected to the frame; a manually operable latch member pivotally connected to the other end of the link means for movement to latching and unlatching positions, the link means having lowered and raised positions in the latching and unlatching positions, respectively, of the latch member, the latch member and the link means having engageable limiting means for limiting pivotal movement of the link means in a first direction from the lowered position thereof to a third position beyond the raised position; and biasing means for pivoting the link means in the direction opposite to the first direction to reach the raised position thereof, the biasing means resiliently opposing pivotal movement of the link means in both directions from the raised position, the latch member and the link means having cooperable means for resiliently opposing pivotal movement of the latched member relative to the link means.

4,008,585

LOCKING COVER FOR METER CLAMPING RING

George A. Lundberg, Pompton Lakes, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Dec. 1, 1975, Ser. No. 636,356
Int. Cl.² G01R *11/04;* **F16L** *21/06*
U.S. Cl. 70—164 **6 Claims**



1. A locking assembly particularly adapted for use with an electric meter clamping ring of the type having outwardly turned adjacent ends fastened together, and aligned apertures for receiving a locking member of the type having an enlarged head at one end and expansible locking projections at the other end, said assembly comprising a cup-shaped housing open at one end only to receive and enclose the outwardly turned ends, one side of said housing wall having an aperture positioned to be aligned with the apertures in the clamping ring ends when assembled thereon to receive the locking member, a pair of locking member engaging legs disposed in the housing, said legs being secured to the housing and having apertures aligned with the aperture in said one side of the housing to receive the locking member and being positioned in the housing in such spaced relation to each other and to said side of the housing that the enlarged head of an assembled locking member bears against the leg nearest said side of the housing, the locking mechanism of the locking device extends through the aperture in the other leg and locks on the remote side thereof to prevent axial movement of said locking member and retain it so positioned that the outer surface of the enlarged head is disposed at or inside of the outer surface of the housing wall.

4,008,586

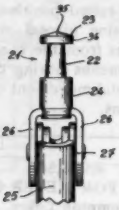
KEY ATTACHMENT DEVICE FOR KEY CASE

Edmund Schnitzer, Montreal,.Canada, assignor to Renwick of Canada Inc., Montreal, Canada

Filed Feb. 12, 1976, Ser. No. 657,478
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 B **8 Claims**

1. A key attachment device for securing at least one key in a key case or the like receptacles, said device comprising an attachment plate having a hollow housing, said housing having a side wall and disposed in a face of said attachment plate, at

least one transverse slot in said side wall for receiving an attachment end of a key hook member therein, means for retaining said attachment end in said slot; said attachment end having a tapered shaft portion of circular cross-section, an enlarged heat at a free upper end of said shaft portion, said tapered shaft tapering outwardly from said head, said head being retained captive in said hollow housing with said shaft portions protruding through said slot, said shaft portion per-



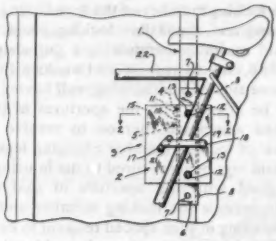
mitting rocking side displacement of said attachment end in said slot and arcuate displacement along said slot, said attachment end being further provided with a base portion formed integral with said shaft portion at an end opposite said end having said head, said base portion having a cross-section larger than said shaft whereby said shaft is recessed between said head and said base portion, and a key hook pivotally secured to said base portion between a pair of parallel side arms.

4,008,587

BICYCLE LOCK ASSEMBLY

Herman C. Frentzel, Shorewood, and Thomas H. Frentzel, Whitefish Bay, both of Wis., assignors to Frentzel Products, Inc., Milwaukee, Wis.

Filed Jan. 12, 1976, Ser. No. 648,145
Int. Cl.² E05B *71/00, 67/38*
U.S. Cl. 70—235 **8 Claims**



1. A locking assembly, the combination comprising:
a face plate having a pair of laterally spaced openings;
means for mounting said face plate to a wooden wall stud having an exposed edge and a pair of sides, said mounting means includes a stud guard which is fastened to said stud to substantially cover a portion of its exposed edge and one of its sides, and a base member which fastens to said face plate and extends rearward therefrom to fasten to said stud and substantially cover its other side immediately behind said face plate, said face plate being positioned over and against the portion of said stud guard which covers the edge of the wall stud; and
a rigid, U-shaped locking member having leg portions which extend through said spaced openings, one of said legs having an eye formed on its end, through which a lock may extend to inhibit the withdrawal of said locking member from said openings.

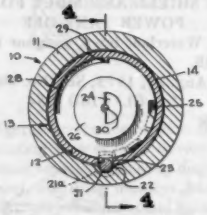
7. In a lock assembly for mounting on an upright support, the combination comprising:
a face plate for extending across the front of said upright support;
shielding webs extending rearward from said face plate to overlie opposite side surfaces of said upright support;
a hood between said shielding web and said face plate forming a lock cavity behind said face plate; and
an encircling loop extending forward from and then turning back toward said face plate, said loop having a leg with a locking eye that extends through said face plate to position said eye in said cavity.

4,008,588

ROTARY PLUG CYLINDER LOCK CONSTRUCTION

Harry C. Miller, Rochester, N.Y., and Herman Edward Tickel, Jr., Centreville, Va., assignors to H. Edward Tickel, Jr., Centreville, Va. and Harry C. Miller, Rochester, N.Y., part interest to each

Filed Apr. 28, 1976, Ser. No. 681,241
Int. Cl.² E05B *29/04, 63/00*
U.S. Cl. 70—366 **23 Claims**



1. A cylinder lock of the rotatable disc tumbler type comprising a stationary cylinder casing, a rotatable plug assembly in said casing including an inner shell member rotatable in said casing and a plurality of locking disc tumblers encircled within said shell member and rotatable about a common axis therein, locking means normally restrained by said dsic tumblers at a position for locking said inner shell to the casing, the disc tumblers having gates alignable with and adapted to receive said lockings means to permit rotation of the inner shell relative to the casing and said tumblers having key openings therein collectively defining a forwardly opening key way and shaped to be engaged and angularly moved by a key inserted therein for aligning the gates with the locking means, said locking disc tumblers each having a cylindrical boss formation projecting axially of the plug assembly from a first face thereof in a first direction and having a cylindrical recess in the opposite face thereof conforming in size and shape to said boss, said disc tumblers being arranged in an internesting stacked array with said boss formation received in nested relation in the recess of an immediately adjacent tumbler and said boss formations each having an axial extent greater than the space between adjacent disc tumblers in the stacked array whereby a barrier is formed across each intertumbler space at a location radially outwardly encircling the key way to prevent insertion of picking tool portions between tumblers from the key way into the gate regions thereof.

4,008,589

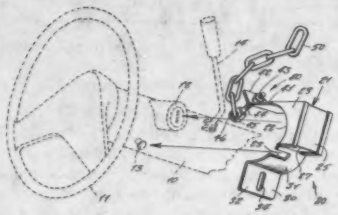
IGNITION SWITCH SECURITY SHIELD PROTECTION AGAINST CAR THEFT

Washington Harrell, 143-18 182nd Place, Springfield Gardens, N.Y. 11413

Filed Feb. 2, 1976, Ser. No. 654,723
Int. Cl.² E05B *17/14*
U.S. Cl. 70—424 **6 Claims**

1. An ignition switch security shield comprising a base portion having a first side wall, a second side wall, a first end wall, a second end wall, and a base wall, each of said first and

second sidewalls having one curved edge for mating engagement with a steering post of an automobile or the like, a first bracket extending from one edge of said first end wall and having a first curved portion and a second straight portion, said second straight portion having an opening therein for the reception of a link of a chain therethrough, a second bracket extending from one edge of said second end wall and having a straight portion projecting from said one edge of said second end wall, and an angle plate projecting from said straight



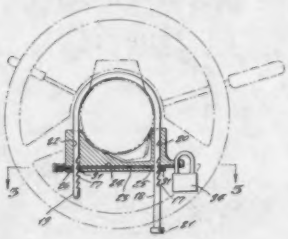
portion, and means for securing said base portion, said first bracket, and said second bracket to a steering post of an automobile or the like, wherein said means for securing comprises a chain, a bolt having an enlarged head, said enlarged head having an opening formed therein for the reception and securement therein of a link of said chain, and a nut welded to the inner surface of said angle plate, said angle plate having an opening therein for the reception of said bolt therethrough so that said bolt may be rotated in said nut and thereby adjust the length of said chain.

4,008,590

AUTO STEERING WHEEL LOCK PROTECTOR

Joseph Berkowitz, and Minerva Berkowitz, both of 8 Tyler Place, Hewitt, N.J. 07421

Filed Mar. 29, 1976, Ser. No. 671,366
Int. Cl.² E05B *17/14*
U.S. Cl. 70—424 **1 Claim**



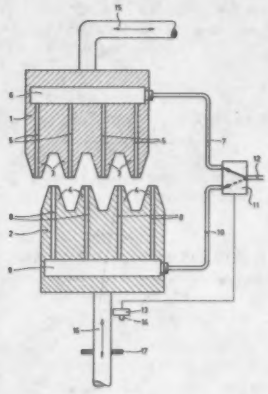
1. In an auto steering wheel lock protector, the combination of a case for enclosing an ignition lock protruding from a side of a steering post column, a U-shaped rod for retaining said case to said column, and a locking means for rigidly securing said rod to said case so to prevent dislodging thereof from enclosing said ignition switch; said case comprising a strong metal member having a notch on one side so to receive a cylindrical side of said column, and a cavity in said notch to receive said ignition lock; each opposite end of said U-shaped rod having a row of ratchet teeth, one said rod end being slidable in a first opening through said block while the other said rod end is slidable in a second opening through said block, each said rod ends also being slided through a separate slot formed in a transversely slidable plate within said case, a third opening of said case being aligned with a circular opening through said plate for receiving a padlock when said rows of ratchet teeth engage one end edges of said slots and providing said locking means.

4,008,591

DEVICE FOR ZIGZAG FOLDING OF STRIP MATERIAL

Leonardus Vos; Joannes Theodorus van der Sanden, and Adrianus Johannes Van Mensvoort, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,609
Claims priority, application Netherlands, Sept. 11, 1974, 7412054
Int. Cl.² B21D *13/02*
U.S. Cl. 72—38 **4 Claims**



1. A device for zigzag folding of material, comprising two oppositely arranged dies having faces facing each other and a set of strip deforming teeth in each respective face; and means for reciprocatably moving said dies relative to each other in an axial direction, and in a direction transverse to said axial direction, such that the dies are moved axially alternately from a closed position in which said sets of teeth engage each other to an open position in which said sets of teeth are apart from each other, and are alternately displaced in opposite transverse directions over a distance corresponding to a pitch distance of the teeth;

wherein said device comprises means for providing a fluid pressure different from atmospheric pressure; a control device; and two duct systems, each opening at one end into a respective die face having teeth, and communicating at another end with said control device; said control device comprising means for alternately connecting one of said duct systems to said providing means during successive open positions of the dies, whereby material being folded is held alternately against one of the two die faces.

4,008,592

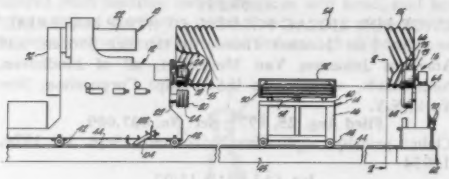
METHOD AND APPARATUS FOR FLANGING A LENGTH OF SPIRALLY WOUND CORRUGATED PIPE

Robert E. Hall, Newport Beach, and Clyde Lamar, West Sacramento, both of Calif., assignors to W. E. Hall Company, Irvine, Calif.

Filed July 23, 1975, Ser. No. 598,173
Int. Cl.² B21D *19/04*
U.S. Cl. 72—70 **26 Claims**

1. An apparatus for flanging a length of spirally wound corrugated pipe which comprises: means for supporting said pipe length; and a recorrugating and flanging assembly, said assembly including a pair of rollers for gripping one end of said pipe length, said rollers having corrugations on the surfaces thereof, means for driving said rollers to impart annular

corrugations to said end of said pipe length, means for flaring said end of said pipe length outwardly therefrom, forming means for converting said outwardly flared end of said pipe length into a substantially perpendicular disposition with re-



spect to the longitudinal axis of said pipe length thereby forming, and means for trimming the perimeter portion of said radial end flange to provide a substantially uniform radial dimension.

4,008,593

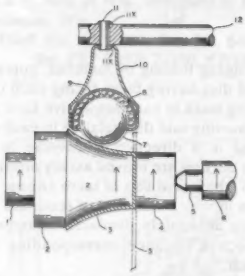
DEVICE FOR SPINNING OF METAL OBJECTS

Richard L. Ciccarello, 7 Park Ave., Glen Cove, N.Y. 11542

Filed June 27, 1975, Ser. No. 590,965

Int. Cl.² B21D *22/16*

U.S. Cl. 72—75 **1 Claim**



1. As an article of manufacture, a hand held individually operated tool for selectively spinning a metal sheet into curved artistic objects consisting essentially of a longitudinal handle having an aperture at a right angle to the handle axis in suitable spaced relationship to an end thereof; a ball assembly consisting of a large metal hard ball having an exposed portion for contacting said metal sheet while spinning, a housing captively retaining said hard ball with an exposed ball surface and having an apertured neck portion disposed away from said exposed surface, a plurality of ball bearings disposed in said housing captively between said hard ball and the housing wall, a rod fixedly secured to said neck portion and passing through its aperture at a right angle, said rod having a threaded portion at the unsecured end thereof; a first disc having a serrated teeth face and secured fixedly upon and to said rod adjacent to said neck housing portion; a second serrated disc adapted to co-act with said first disc in selective locked serrated relationship and having a tubular portion for slidably engaging said rod in the handle aperture; and threaded nut means for engaging the threaded rod end extending through said handle aperture whereby the hard ball retaining housing is selectively rotated through a suitable arc at a right angle to the handle axis and thereafter locked in serrated teeth relationship for artistically deforming said sheet metal.

4,008,594

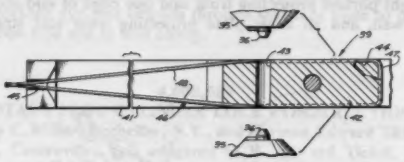
WIRE COILING MACHINE

George Noyce, Cucamonga, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Oct. 2, 1975, Ser. No. 618,957

Int. Cl.² B21F *3/04*, *35/00*

U.S. Cl. 72—142 **11 Claims**



1. A wire coiling machine comprising:

a. a supporting means for a wire blank having a cross element and a pair of essentially parallel and coplanar arm elements, the supporting means including an end support for the cross element and opposed side supports for the portions of the arm elements adjacent the cross element, and at least one journal bore tangent to a corresponding arm element intermediate its ends, the portions of the arm elements extending beyond the journal bore being free to coil about the axis of the journal bore;

b. a mandrel axially movable into and out of the journal bore for receiving the extended portion of the arm element as it is coiled;

c. a coiling head rotatable about the mandrel to coil the extended portion of the arm element while the remainder of the wire blank remains fixed on the supporting means.

4,008,595

METHOD AND APPARATUS FOR ARCUATELY BENDING AND ROLLING AN ELONGATED METALLIC WORKPIECE

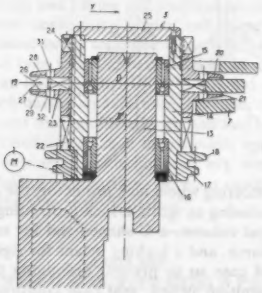
Walter Allenspach, Bachtobelstrasse 66, CH-8560 Ottoberg, Switzerland

Filed Apr. 7, 1976, Ser. No. 674,631

Claims priority, application Switzerland, Apr. 8, 1975, 4409/75

Int. Cl.² B21D *7/08*

U.S. Cl. 72—170 **10 Claims**



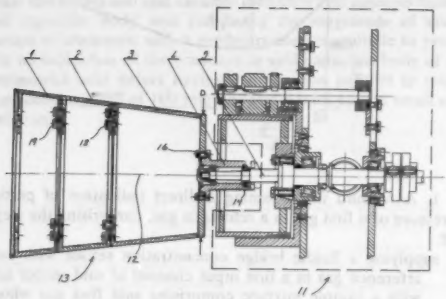
1. A method of treating an elongated workpiece comprising the steps of: orienting three bending rollers to define an arcuate path; passing said workpiece longitudinally along said path to bend said workpiece into an arcuate shape, whereby ridges form on said workpiece during such bending; and machining said ridges off said workpiece at least partially as said workpiece passes along said path.

4,008,596

APPARATUS FOR TRANSFORMING THE CROSS-SECTION OF A THIN-WALLED CYLINDER

Radoslav Stanev Petrov; Stefan Elenkov Zahariev; Ivan Kirilov Markov, and Georgi Vassilev Peychev, all of Sofia, Bulgaria, assignors to DSO "Montagi", Sophia, Bulgaria

Filed Dec. 19, 1975, Ser. No. 642,495
Claims priority, application Bulgaria, Dec. 19, 1974, 28504
Int. Cl.² B21D *41/00*
U.S. Cl. 72—176 4 Claims



1. In an apparatus for transforming the internal cross-section of a thin-walled cylinder, advanceable in a first direction along a first axis, from a first circular form to a second symmetrical, non-circular closed form, a cylindrical mandrel coaxial with the thin-walled cylinder, the mandrel having an outer surface aligned with and corresponding at its input end in shape to the first circular form of the advancing pipe, the contour of the outer surface of the mandrel varying in the first direction from the first circular form at its input end to the second non-circular form at its output and, whereby the internal cross-section of the cylinder is constantly and gradually urged from the first form to the second form as the cylinder traversed the mandrel, the improvement wherein the circumference of the mandrel is constant throughout the length thereof and wherein the apparatus further comprises means supporting the mandrel for rotation about the first axis.

4,008,597

METHOD FOR SHAPING A SLIT PRODUCT

Ronald D. Bartram, Raleigh, N.C., and Charles J. Runkle, Guntersville, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 10, 1975, Ser. No. 630,462
Int. Cl.² B21B *1/00*
U.S. Cl. 72—199 1 Claim

1. A method for shaping a slit product having a burr formation, comprising the steps of:

positioning in engaging relationship a pair of revolving rolls wherein one roll contains a continuous annular groove having a curved bottom position and a second roll has a continuous annular land; and

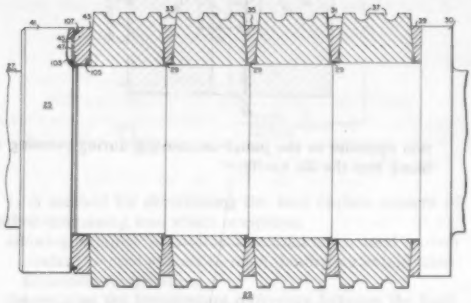
feeding said slit product into said rolls at an angle of 7°–30° with the tangent plane of said rolls and in such a manner that said burr formation is oriented in said curved bottom position.

4,008,598

WORK REDUCING

John Charles Purcupile, Monroeville; Martin J. Dempsey, Bethel Park, and Selwyn Raymond Rackoff, Pittsburgh, all of Pa., assignors to Asko, Inc., West Homestead, Pa.

Filed Nov. 13, 1975, Ser. No. 631,635
The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.
Int. Cl.² B21B *31/08*
U.S. Cl. 72—237 10 Claims



1. Roll apparatus for reducing work including an arbor, at least one roll mounted on said arbor for rotation therewith, an annulus, having an annular cavity therein, mounted on said arbor coaxial with said roll for rotation with said arbor, a deformable membrane, of a material capable of withstanding high pressure, sealed pressure tight to said annulus about said cavity, forming a closure for said cavity by a weld, and connected to said roll to transmit lateral force to said roll on the deformation of said membrane on the application of pressure thereto, and means, connected to said cavity, for injecting hydraulic fluid under pressure therein to deflect said membrane, whereby rotation of said roll relative to said arbor is suppressed.

4,008,599

APPARATUS FOR MAKING BEVEL GEAR

Fritz Dohmann, Ruckersdorf, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

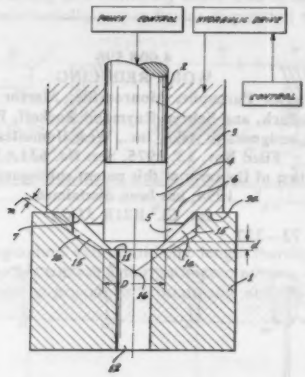
Filed Sept. 26, 1975, Ser. No. 617,008
Claims priority, application Germany, Sept. 28, 1974, 2446413
Int. Cl.² B21D *22/00*, *53/28*
U.S. Cl. 72—354 3 Claims

1. In an apparatus for making bevel gear the apparatus having a die with a cavity corresponding to the contour of the bevel gear to be made, the cavity having a bottom at the smallest gear diameter and ridges corresponding to the grooves of the bevel gear, the ridges also defining the pitch cone for the bevel gear, the apparatus further having a punch and a counter-punch, the punch moving axially in the counter punch both being situated at the same side of the die, the improvement comprising:

the punch having an outer diameter and the counter punch having a corresponding inner diameter, these diameters being equal to the diameter of a circle defined by the intersection of said pitch cone with said bottom, at an accuracy of not more than 20 % tolerance; and

the counter punch having a lower front face from which projects a truncated, conical projection having a contour

corresponding to a cone as defined by said ridges, said counter-punch being disposed for retraction in a direc-



tion opposite to the punch as moving during pressing a blank into the die cavity.

4,008,600

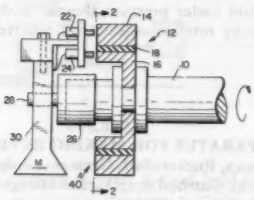
TORSIONAL VIBRATION DAMPER MEASURING

Robert Charles Bremer, Jr., Brownsburg, and Hans Otto Haupt, Indianapolis, both of Ind., assignors to Wallace-Murray Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 622,533, Oct. 15, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,278

Int. Cl.² G01M *13/00*

U.S. Cl. 73—11 **8 Claims**



1. A method of measuring the performance of a rotating torsional vibration damper, the damper being of the type having a hub adapted to be coupled to a rotating shaft, the shaft subject to torsional vibrations while rotating, the hub carrying an annular inertia member, whereby the inertia member torsionally vibrates out of phase with the torsional vibrations of the hub, the method characterized by,

a. providing means carried by a surface portion of said hub member for varying the intensity of light reflected therefrom upon rotation of the hub,

b. providing means carried by a surface portion of said inertia member for varying the intensity of light reflected therefrom upon rotation of the inertia member,

c. illuminating each of said hub and inertia member means and then sensing the light reflected therefrom,

d. converting said sensed, reflected light from said hub means into a first electrical signal and converting said sensed, reflected light from said inertia member means into a second electrical signal,

e. comparing said electrical signals, to thereby measure damper performance.

4,008,601

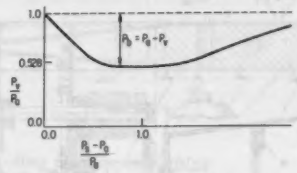
FLUIDIC PARTIAL PRESSURE SENSOR

Robert L. Woods, Arlington, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 16, 1975, Ser. No. 587,474

Int. Cl.² G01N *1/24*

U.S. Cl. 73—23 **2 Claims**



1. A method for obtaining a direct indication of partial pressure of a first gas in a reference gas, comprising the steps of:

supplying a fluidic bridge concentration sensor with said reference gas in a first input channel of said sensor and with a sample mixture comprising said first gas whose partial pressure is desired to be measured in said reference gas in a second input channel of said sensor;

exhausting said sample mixture and said reference gas through a reference output which ensures that said pressure drop across said fluidic bridge concentration is proportional to the ambient pressure by application of a vacuum, wherein said vacuum is achieved by means of a fluidic aspirator operated in its sonic region; and

measuring the pressure difference across said input channels thereby obtaining a signal output which provides a pressure directly proportional to the partial pressure of said first gas in said reference gas.

4,008,602

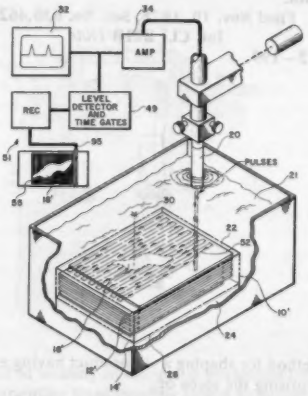
ULTRASONIC TESTING OF MULTILAYER CERAMIC CAPACITORS

Gordon R. Love, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,420

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 R **6 Claims**



1. A method of determining the presence of detrimental void defects in a multilayer ceramic capacitor body having a pair of parallel opposed surfaces and having a plurality of planar metal electrodes, the planar surfaces of said metal

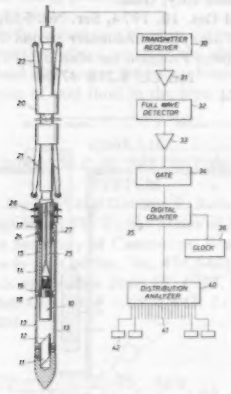
electrodes being arranged parallel to said parallel opposed surfaces and separated by and completely enclosed within ceramic dielectric said method comprising transmitting ultrasonic energy at a selected ultrasonic frequency into a fired ceramic capacitor body having from about 5 to 100 planar parallel metal electrodes, said electrodes being from about 2 to 10 microns thick and separated from each other by about 15 to 100 microns of ceramic, the direction of said ultrasonic energy being substantially perpendicular to a surface of said capacitor body and to said planar metal electrodes; detecting a portion of said ultrasonic energy which passes through said metal electrodes and said ceramic dielectric and emerges from said capacitor body; and comparing the magnitude of said portion of ultrasonic with a predetermined magnitude to provide an indication of the presence in said capacitor body of a detrimental void defect having a dimension parallel to said electrodes as small as 100 microns and a thickness as small as 5 microns.

4,008,603

ULTRASONIC METHOD AND APPARATUS FOR MEASURING WALL THICKNESS OF TUBULAR MEMBERS

George T. Paulissen, La Porte, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1975, Ser. No. 645,051
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **5 Claims**



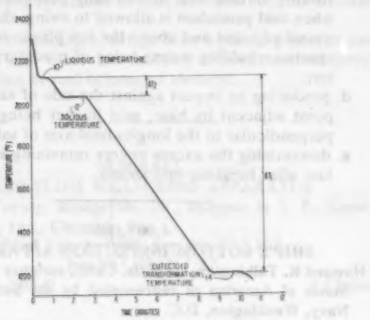
1. A method for measuring the wall thickness of a tubular member comprising:
- repetitively generating within said member an ultrasonic pulse;
- directing said pulses in a direction normal to the wall of the member;
- detecting the returning echoes of said pulses;
- measuring time period between the echoes from inner and outer walls of the member; and
- accumulating said measured time periods in a series of counter memories, each of said counter memories accumulating the time periods falling within preset limits.

4,008,604

DETERMINATION OF CARBON ANALYSIS IN IRONS

Maurice P. Roach; Ann E. Schoenjahn, and Larry G. Carmack, all of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 7, 1976, Ser. No. 674,427
Int. Cl.² G01N *25/02*
U.S. Cl. 73—17 R **10 Claims**



1. A method for determining the total carbon content of carbon-containing iron which comprises:
- allowing samples of molten iron of known total carbon content to cool at least through the first eutectoid transformation temperature;
- determining the temperature difference between the liquidus and first eutectoid transformation temperature for each of the said samples of known total carbon content;
- determining a standard liquidus-first eutectoid transformation temperature difference with respect to carbon content;
- allowing a sample of iron of unknown total carbon content to cool at least through the first eutectoid transformation temperature;
- determining the liquidus-first eutectoid transformation temperature difference for the said sample of unknown total carbon content; and
- comparing the resulting liquidus-first eutectoid transformation temperature difference for the sample of unknown total carbon content with the standard liquidus-first eutectoid transformation temperature difference to determine the total carbon content thereof.

4,008,605

IMPACT TEST METHOD

Rubin Kravitz, Worcester, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Jan. 21, 1976, Ser. No. 651,326
Int. Cl.² G01N *3/30*
U.S. Cl. 73—101 **9 Claims**

1. A method for determining the impact properties of a stiff plastic material comprising the steps of:
- a. providing a cylindrical strand of solid plastic having a

substantially uniform density and having a smooth continuous circumferential surface area;

b. providing an impact measuring device comprising a specimen holding means, a free swinging pendulum of known energy content having a specimen striking surface, and scale means for measuring the energy extracted from said pendulum;

c. fixedly mounting said strand in said holding means such that a portion of said strand is in the path of said specimen striking surface and substantially perpendicular thereto when said pendulum is allowed to swing, the base of said strand adjacent and above the top planar surface of said specimen holding means being of predetermined diameter;

d. producing an impact against the side of said strand at a point adjacent its base, said impact being substantially perpendicular to the longitudinal axis of said strand; and

e. determining the excess energy remaining in said pendulum after breaking said strand.

4,008,606

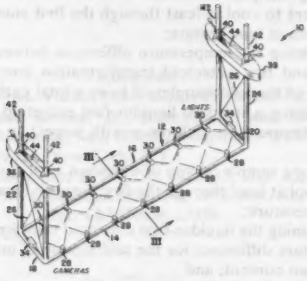
SHIP'S BOTTOM INSPECTION APPARATUS

Howard R. Talkington, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1975, Ser. No. 623,858

Int. Cl.² G01N *19/02;* **G03B** *29/00*

U.S. Cl. 73—104 **10 Claims**



1. An apparatus for inspecting the bottom of a ship while the ship is moving forward in a body of water comprising:

a generally U-shaped framework which is adapted to be suspended in the water for receiving the width of the ship therethrough;

a series of cameras mounted in a spaced relationship along the framework to view vertically upward; and

a series of lights mounted in a spaced relationship along the framework at an acute angle to vertical and directed generally toward the viewing area of the cameras so that backscattering is minimized while ship bottom discontinuties are made evident by shadow effects;

whereby multiple photographs can be taken of the ships bottom to display structural defects.

4,008,607

FUEL CONSUMPTION RATE DETECTING APPARATUS

Katsuhiko Ooiwa, Handa; Shigehiko Ito, Aichi, and Shinichi Maeda, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed June 30, 1975, Ser. No. 592,203

Claims priority, application Japan, July 15, 1974, 49-81276

Int. Cl.² G01M *15/00*

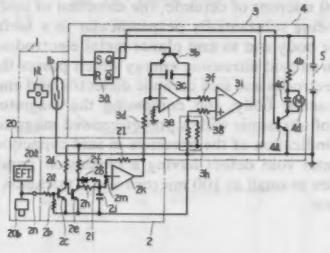
U.S. Cl. 73—114 **7 Claims**

1. A fuel consumption rate detecting apparatus for a vehicle having an engine comprising:

means for generating a direct current voltage representing an amount of fuel consumption per unit time;

means for generating a first pulse signal whose frequency is proportional to the vehicle speed;

means, connected to the above two means, for generating, in synchronism with said first pulse signal, a second pulse signal whose pulse width is inversely proportional to said amount of fuel consumption per unit time;



means, connected to said second pulse signal generating means, for sensing the mean value of said second pulse signal; and

means, connected to last said means, for indicating said mean value representing a vehicle running distance per unit fuel consumption amount.

4,008,608

METHOD OF PREDICTING GEOTHERMAL GRADIENTS IN WELLS

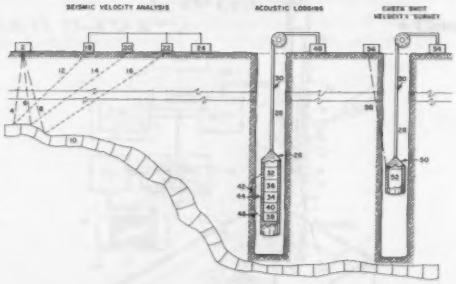
Edward B. Reynolds, Spring, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed Oct. 10, 1974, Ser. No. 513,791

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² E21B *47/06*

U.S. Cl. 73—154 **10 Claims**



1. A method of predicting the geothermal gradient of subterranean strata by determining velocity trends in the strata and comparing same with the velocity trends of formations for which geothermal gradients have previously been determined and plotted on semi-logarithmic paper as a family of curves of velocity trends versus geothermal gradients comprising:

a. determining the velocity trend at various depths of a wave propagated through the subterranean strata,

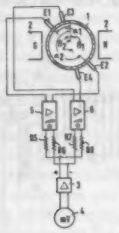
b. plotting the velocity trend versus depth on semi-logarithmic paper to generate a curve, and

c. comparing the curve obtained with a family of similar curves of known geothermal gradients.

4,008,609
INDUCTIVE FLOWMETER

Josef Lambrecht, Porz-Eil; Klaus Mendte, Bensberg-Refrath, and Rudolf Schmidt, Rosrath, all of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Filed Oct. 2, 1975, Ser. No. 619,029
Claims priority, application Germany, Oct. 15, 1974, 2448945
Int. Cl.² G01F 1/58
U.S. Cl. 73—194 EM **4 Claims**



1. An inductive flow meter for the flow of an electrically conductive fluid, comprising a metal pipe through which said fluid flows, north and south magnetic poles respectively positioned diametrically outside the pipe and forming a magnetic field having an axis extending through the pipe's inside perpendicular to the pipe's axis, a first pair of electrodes formed by two interspaced electrodes attached to the pipe's outside, a second pair of interspaced electrodes attached to the pipe's outside and means for measuring electric currents between said electrodes, wherein the improvement comprises:

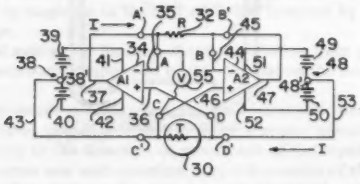
a. said second pair of electrodes being formed by first and second electrodes of which at least one is positioned at an angle substantially different than 90° around the pipe's circumference with respect to at least one of the electrodes of said first pair, all of said electrodes of said first pair and said second pair along with the axis of the magnetic field being positioned in substantially the same radial plane; and

b. said means for measuring electric currents being a differential circuit weighted so that the difference currents between said electrodes depend substantially linearly on the flow rate of said fluid in the pipe.

4,008,610
SELF-BALANCING D.C.-SUBSTITUTION MEASURING SYSTEM

Neil T. Larsen, Boulder, and Gerome R. Reeve, Lafayette, both of Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Continuation-in-part of Ser. No. 476,646, June 5, 1975, abandoned. This application June 17, 1975, Ser. No. 587,565
Int. Cl.² G01F 1/68; G01R 21/02
U.S. Cl. 73—204 **18 Claims**



10. A self-balanced D.C.-substitution system for the measurement of R.F. power comprising:

a temperature dependent bolometer element;

a substantially temperature independent reference resistor element;

first amplifying means;

second amplifying means;

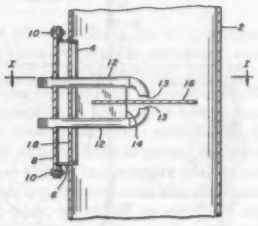
circuit means connecting said first amplifying means, said bolometer element, said second amplifying means, and said reference resistor element in a current loop, one of said amplifying means generating said current with a value to drive the resistance of said bolometer into equality with the resistance of said reference resistor element; and

means for measuring a voltage from a pair of points on said current loop which is a function of direct current power dissipation in said bolometer element.

4,008,611
FLUID FLOW MEASURING APPARATUS

Elmer W. Turocy, Bridgeville, Pa., assignor to S. P. Kinney Engineers, Inc., Carnegie, Pa.

Filed July 1, 1975, Ser. No. 592,108
Int. Cl.² G01F 1/37
U.S. Cl. 73—205 R **4 Claims**



1. Apparatus for producing a pressure differential for measuring flow of a gaseous fluid through a conduit of circular cross-section, comprising:

a pair of hollow tubes secured to the conduit, the axes of the tubes being located in a half plane which extends from and is perpendicular to the axis of the conduit, each of said tubes passing from without to within the conduit, the inner ends of said tubes being open, parallel, confronting, and perpendicular to the axis of the conduit;

a support plate attached to and between the tubes in the half plane of the axes of the tubes; and

a circular plate, having a diameter less than the diameter of the conduit, attached to and supported by the support plate, lying in a plane perpendicular to the axis of the conduit, and parallel to and between the open ends of the tubes, the center of the plate being on the axis of the conduit.

4,008,612
LIQUID QUANTITY DETECTING DEVICE

Tateki Nagaoka, Tokyo; Yoshimasa Kimura, Kawasaki, and Yutaka Komiya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

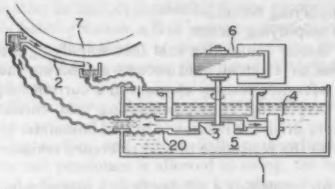
Filed Sept. 17, 1975, Ser. No. 614,183
Int. Cl.² G08B 21/00; G01F 23/00
U.S. Cl. 73—290 R **20 Claims**

1. A liquid quantity detecting device comprising:

a liquid container;

liquid circulating means disposed within said container for circulating liquid through a predetermined path so that bubbles are produced in the liquid when the quantity of same decreases below a particular level; and

bubble detector means disposed adjacent said liquid path



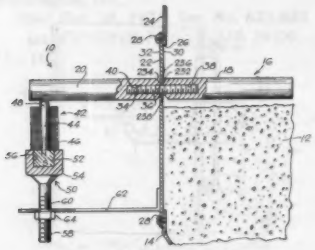
for detecting said bubbles and for producing a corresponding detection signal.

4,008,613

VIBRATORY BIN LEVEL INDICATORS

Donald M. Myers, Berrien Springs, Mich., assignor to Ludlow Industries, Inc., Batavia, Ill.

Filed Oct. 3, 1975, Ser. No. 619,524
Int. Cl.² G01F *23/28*
U.S. Cl. 73—290 V **9 Claims**



1. A level indicator for indicating the level of a flowable material in a bin or other receptacle,

comprising a wall member adapted to form a wall element of the receptacle,

said wall member having inner and outer sides,

a vibratory system including an inner rod element extending transversely from said inner side of said wall member,

an outer rod element extending transversely from said outer side of said wall member,

and means for securing said inner and outer rod elements to said respective inner and outer sides of said wall member,

said inner and outer rod elements having axes in substantial alignment,

said means including a threaded screw stud extending between said inner and outer rod elements for clamping said rod elements against said inner and outer sides of said wall member,

said wall member having an opening for receiving said stud,

said rod elements having threaded openings for receiving said stud,

vibration inducing means for causing vibrations of said outer rod element and thereby causing sympathetic vibrations of said inner rod element,

sensor means for sensing the magnitude of the vibrations of said outer rod element,

such magnitude being decreased by any engagement of the flowable material with said inner rod element,

said outer rod element having a natural vibration frequency,

said vibration inducing means including impulse means for producing impulses of force upon said outer rod element at a low repetition frequency substantially below said natural vibration frequency,

said sensor means including means responsive to vibrations at said natural vibration frequency,

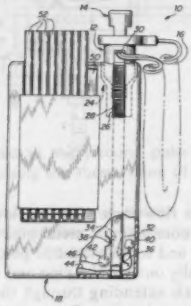
and gating means for causing said sensor means to be inactive during said impulses while causing said sensor means to be active during the intervals between said impulses.

4,008,614

REMOVABLE PROBE UNIT FOR ELECTRONIC MEASURING SYSTEM

Robert Bruce Turner, Weymouth, and Paul E. Brefka, Southboro, both of Mass., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 28, 1976, Ser. No. 681,211
Int. Cl.² G01K *1/14*
U.S. Cl. 73—343 R **10 Claims**



1. An independent, replaceable probe unit for an electronic measuring system having a housing with a compartment for receiving said probe unit, comprising:

a probe member including a probe element bearing a sensor device for sensing the parameter to be measured by the system and a cable electrically connected to said sensor device; and

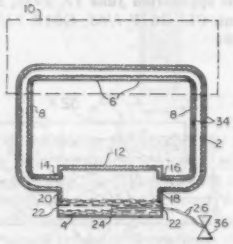
a probe chamber removably mountable in said compartment and having a recess for receiving said probe member, said chamber including contact means interconnected with said cable and disposed to engage corresponding contact means in said compartment for interconnecting said probe member with the electronic measuring system.

4,008,615

TEMPERATURE AVERAGING DEVICE

Malcolm D. MacMaster, Washington Crossing, Pa., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Apr. 28, 1975, Ser. No. 572,252
Int. Cl.² F25B *49/00*; G01K *1/16*
U.S. Cl. 73—343 R **9 Claims**



1. A temperature averaging and sensing device for use with a refrigeration control system for monitoring refrigeration requirements of a food case or other selected environment which comprises:

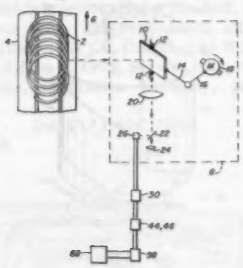
a. a hermetically sealed refrigeration conduit such as a closed loop tube partially filled with refrigerant, which comprises:
   1. an elongated condenser section located directly within the refrigerated environment; and
   2. an evaporator section in full fluid flow communication with said condenser section;
b. a collection pot for the liquid refrigerant which will assume the average temperature sensed in the refrigerated environment and located below and between said condenser section and said evaporator section and connected to be in full fluid flow communication therewith, said collection pot providing a storage location for the coldest liquid refrigerant and being hermetically sealed from the ambient, said pot being located within said evaporator section of said refrigeration conduit;
c. a sensing well attached to and positioned towards the bottom of said collection pot for providing a location for sensing the temperature of refrigerant in the bottom of said pot, said well being hermetically sealed with respect to the interior of said collection pot; and
d. a temperature sensing probe located within said well in the bottom of said collection pot for sensing the temperature of refrigerant located within the bottom of said collecting pot as an indication of the average of the temperatures sensed throughout the refrigerated environment.

4,008,616

SCANNING PYROMETER

Thomas P. Murray, Churchill Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1975, Ser. No. 624,024
Int. Cl.² G01K *13/06*
U.S. Cl. 73—355 R **5 Claims**



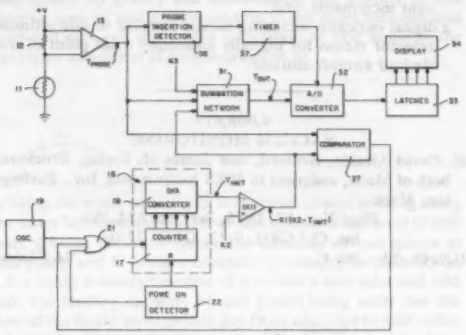
1. A scanning pyrometer for measuring the maximum temperature of moving material having a plurality of separate components which may occur in a non-uniform pattern comprising:
   a thermal radiation detector for providing an electrical output in response to thermal radiation received by the detector,
   an optical system for focusing thermal radiation from part of the separate components of the material on the detector,
   oscillating means in said optical system whereby the detector receives radiation from traversing a region generally transverse to the direction of movement of the separate components and said electrical output is a series of electrical pulses from each traverse, each electrical output being representative of the temperature of a separate component, and
   means connected to said detector for providing a continuous electrical signal representative of the peaks of said electrical pulses.

4,008,617

ELECTRONIC THERMOMETER AND METHOD

David H. Yen, Sunnyvale; Tim R. Connely, Campbell, and John J. Lee, Cupertino, all of Calif., assignors to Filac Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 539,927, Jan. 9, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,430
Int. Cl.² G01K *3/00*
U.S. Cl. 73—362 R **9 Claims**



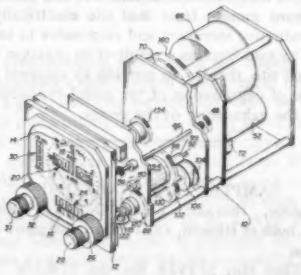
1. In a method of determining the temperature of a body utilizing a sensing element having an initial temperature different than the temperature of the body, the steps of: bringing the sensing element into contact with a predetermined region of the body, the temperature of said region being changed by the contact with the sensing element, maintaining the sensing element in contact with the body to permit the temperature of the sensing element and the temperature of the predetermined region to approach equilibrium with the temperature of the remainder of the body, providing an electrical signal corresponding to the temperature of the sensing element, storing a signal corresponding to the initial temperature of the sensing element, and combining the stored signal with the temperature signal a predetermined time after the sensing element is brought into contact with the body to provide an advance indication of the equilibrium temperature.

4,008,618

FLIGHT INSTRUMENT

James R. Younkin, Fayetteville, Ark., assignor to Edo-Aire Mitchell Industries, Inc., Mineral Wells, Tex.

Division of Ser. No. 454,305, March 25, 1974, Pat. No. 3,940,990. This application Aug. 4, 1975, Ser. No. 601,823
Int. Cl.² G01L *7/14*
U.S. Cl. 73—387 **14 Claims**



1. A flight instrument as part of an altitude indicator system having a pressure transducer generating a signal varying with aircraft altitude and including an atmospheric pressure set point adjustment, comprising in combination:
   altitude indicator means having digital display means and

analog display means each responsive to the signal varying with aircraft altitude,

altitude selector means for generating a signal to an altitude control system to establish a desired aircraft altitude, said altitude selector means including a first adjustment means and a second adjustment means, the first adjustment means varying the altitude selection over the most significant increments thereof and the second adjustment means varying the altitude selection over the least significant increments, and

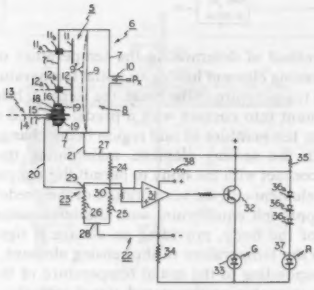
a digital indicator including means coupled to said altitude selector means for digitally indicating a set point of the desired aircraft altitude.

4,008,619

VACUUM MONITORING

H. David Alcaide, Bedford, and James H. Ewing, Brockton, both of Mass., assignors to MKS Instruments, Inc., Burlington, Mass.

Filed Nov. 17, 1975, Ser. No. 632,460
Int. Cl.² G01L *9/12*; G01N *27/04*
U.S. Cl. 73—398 C **16 Claims**



1. Apparatus for monitoring the change in the electrical resistive condition from an initially determined resistive condition of a layer of highly-reactive getter material located at an initially substantially evacuated site which is rendered physically inaccessible by sealing, comprising at least a pair of electrically-isolated electrically-conductive members each having surfaces both within and remote from said site, electrically-insulating material sealed with said members and preserving the electrically-isolated relationship thereof while disposing surface area therebetween at said site, a continuous layer of said getter material deposited upon said surface area and making electrical contacts with said surfaces of both of said conductive members within said site, and electrical measurement means remote from said site electrically coupled with said conductive members and responsive to said change as exhibited by said layer as a result of its reaction with gases present at said site, thereby to provide an external indication of the degree of degradation of the initial evacuation at said site prior to the exhaustion of the getter.

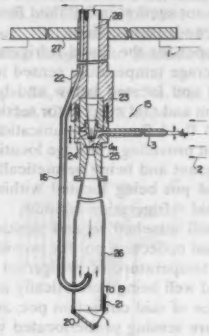
4,008,620

SAMPLER FOR ANALYZERS

Kiyoshi Narato, Ibaraki; Keizo Ootsuka, and Syoichi Sawahata, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 5, 1975, Ser. No. 574,336
Claims priority, application Japan, May 7, 1974, 49-49757
Int. Cl.² G01N *1/24*
U.S. Cl. 73—421.5 A **6 Claims**

1. A sampler for analyzers comprising a clean-gas supply pipe provided with a nozzle tip which may or may not be interchangeable, a sampling tube for drawing in a sample for analysis, an extracting tube for conducting the sample after dilution to an analyzing instrument, said sample being admitted to the sampler as a result of the suction created by the clean gas during its introduction into the same vessel, said sample then being diluted with the clean gas and led to the



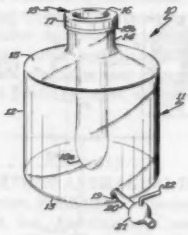
analyzer via the extracting tube, and which also comprises a suction pipe in which the free end of the extracting tube for conducting the sample to the analyzer is extended to an intermediate point of the pipe, and a sampling nozzle attached to the free end of the suction pipe.

4,008,621

METHOD AND APPARATUS FOR SAMPLING GAS

Nedeljko Ostojic, Coon Rapids, and Vladimir G. Boscak, Minneapolis, both of Minn., assignors to Geo. A. Hormel & Co., Austin, Minn.

Filed July 7, 1975, Ser. No. 593,871
Int. Cl.² G01N *1/24*
U.S. Cl. 73—421.5 R **1 Claim**



1. A method of obtaining a sample of gas, said method comprising the steps of:

opening a valve controlled port of a rigid portable container with an externally located valve, said rigid container having an upwardly opening reduced diameter neck portion having an opening therein, said neck portion comprising an outer peripheral annular lip portion, a fluid impervious elastic diaphragm extending into and closing said opening, said diaphragm having an annular retaining element for grippingly engaging said container neck lip portion;

directing air into said opening by blowing into said neck to thereby cause the elastic diaphragm to expand into the container to progressively force air from the container out through the port until the diaphragm engages substantially the entire inner surface of the container;

manually closing the valve for said port while said elastic diaphragm engages the inner surface of the container, whereby said diaphragm will adhere to the inner surface of the container;

manually placing the container in the gaseous sampling zone and thereafter manually opening the valve to inter-

communicate the container with the sampling zone, whereby the gaseous atmosphere constituting the sampling zone will enter the port and the elastic diaphragm will contract and return to its original position to create suction within the container and cause the gaseous sample to fill the container; and

manually closing said externally located valve thereby closing the valve controlled port.

4,008,622

METHOD OF TESTING THE QUALITIES OF A MATERIAL

Hassan Youssef, Taverny, France, assignor to La Metallurgie Francaise des Poudres Metafram, Paris, France

Filed May 29, 1975, Ser. No. 581,922

Claims priority, application France, June 13, 1974, 74.20487

Int. Cl.² G01N *33/20*

U.S. Cl. 73—432 R **7 Claims**

1. A method of testing the qualities of a porous material for forming at least one portion of a self-lubricating bearing-member containing oil, said method comprising immersing a quantity of said material reduced to powder form in said oil, maintaining said oil at a temperature at most equal to its maximum temperature of use for a period of time of tens of hours, separately maintaining at said temperature and for the same period of time a sample of the same oil without the powder material immersed therein, and verifying that the presence of said powder material in said oil does not produce in the course of said time period perceptible deterioration of the oil, by comparing said oil with the sample of the same oil kept for the same period of time at the same temperature whereby the powder material can be determined as suitable for use as the porous material of the self-lubricating bearing member.

4,008,623

GYROSCOPIC INSTRUMENT

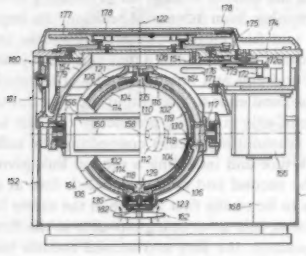
Hans Ehrich, Kiel-Schulensee; Heiko Emshoff, Kiel-Holtenau, and Hans-Peter Otto, Kiel-Projensdorf, all of Germany, assignors to Anschutz & Co. GmbH, Kiel-Wik, Germany

Filed June 3, 1975, Ser. No. 583,206

Claims priority, application Germany, June 5, 1974, 2427192

Int. Cl.² G01C *19/20*

U.S. Cl. 74—5 R **7 Claims**



1. In a gyroscopic instrument, the combination comprising a hollow sphere, at least one motor-driven gyroscope mounted within said sphere, a vessel having an inlet and an outlet and an internal surface of revolution surrounding said sphere at a distance therefrom providing for a gap between the outer surface of said sphere and the inner surface of said vessel, a liquid filling said vessel, guide means on said vessel outside of said gap constituting a passageway leading from said outlet to said inlet, a motor-driven pump included in said passageway for circulating the liquid through said gap and through said passageway, and electrical current-supplying means including conductive electrode portions of said surfaces for supplying electrical energy to said gyroscope through the liquid in said gap, said inlet being located at a lower level than said outlet, said gap having a relatively narrow bearing zone communicating with said inlet and a relatively wider zone communicating with said outlet, said bearing zone having an exit merging said bearing zone with said wider zone, the liquid in said bearing zone portion of said gap forming a bearing supporting said sphere in floating condition spaced from the inner surface of said vessel against vertical and horizontal forces exerted on said sphere by gravity and acceleration, the width s of said bearing zone of said gap amounting at any point between said inlet and said exit during the circulation of said liquid in the operative condition of said instrument to

$$K \frac{d_o}{d} \cdot s_o$$

s_o being the width of said gap at the level of said inlet, d_o being the outer horizontal diameter of said sphere at the level of said inlet, d being the outer horizontal diameter of said sphere at said point, and K being a constant amounting to from 0.9 to 1.3, s being a steady function of d between said inlet and said exit, the feeding capacity of said pump being such that the flow of the liquid through said gap from said inlet to said outlet is laminar, whereby displacement of the center of said sphere from the axis of said internal surface of revolution causes a high lateral force to be produced by the bearing pressure exerted by said liquid on said sphere in said bearing zone to thereby counteract said displacement.

4,008,624

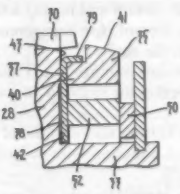
SYNCHRONIZING MECHANISM FOR CHANGE SPEED GEARS

Jean C. Van Dest, Ris-Orangis, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 23, 1975, Ser. No. 570,900

Int. Cl.² F16H *3/38*

U.S. Cl. 74—339 **6 Claims**



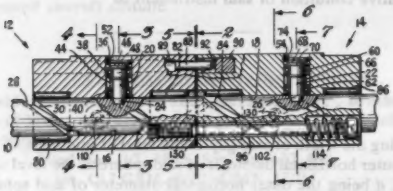
1. In a synchronizing mechanism for change speed gear systems, including a split resilient synchronizer ring encircling the hub of a gear, a locking member for acting on the synchronizer ring in one working direction during synchronizing operation, with said locking member being curved and located within the synchronizer ring, and having stops located opposite each other, with the locking member being separate from said stops and braced between them with its ends respectively bearing against the stops when in its locked position, the improvement wherein a carrier is provided for holding the synchronizer ring, said carrier having an annular disc portion with axially extending flange means for restraining said synchronizer ring from expanding beyond a desired diameter, said annular disc portion of said carrier having a central opening of greater diameter than the diameter of said hub of said gear to permit limited floating movement of said carrier and synchronizer ring in radial directions relative to the axia of rotation of said gear.

4,008,625

FLOATING NUT CONSTRUCTION

Surinder M. Malhotra, Georgetown, Conn., assignor to Norco, Inc., Ridgefield, Conn.

Filed Dec. 15, 1975, Ser. No. 641,082
Int. Cl.² F16H 55/18, 1/18, 55/22, 55/06
U.S. Cl. 74—441 9 Claims



1. A zero-backlash anti-friction nut construction for engagement with the threads of a screw, comprising in combination:

a. a first nut section having a through bore to receive the screw,

b. a second nut section disposed end to end to the first section and having a through bore in axial alignment with the first bore,

c. a roller carried by the first nut section, having a tip portion extending into the bore thereof for engagement with the walls of the grooves in the screw,

d. anti-friction means mounting said roller on the nut section for rotation about its axis during such engagement,

e. spring means biasing said roller in a generally radially inward direction with respect to the first nut section to thereby maintain such engagement,

f. an additional roller, said additional roller being carried by the second nut section and having a tip portion extending into the bore thereof, for engagement with the walls of the grooves in the screw,

g. anti-friction means mounting said additional roller on the second nut section for rotation about its axis during such engagement,

h. spring means biasing said additional roller in a generally radially inward direction with respect to the second nut section,

i. bearing means carried by said nut sections for maintaining their bores substantially in axial alignment with respect to one another, and with respect to the axis of the screw, and

j. means carried by at least one of said sections, for biasing the sections in axial opposed directions with respect to one another and opposing the action of the spring means associated with said rollers, said section biasing and spring means cooperating to minimize looseness and slop in relative axial directions between each of the nut sections and the threads of the screw while at the same time said section biasing means enables the nut sections to float laterally to their axes with respect to each other,

k. said bearing means comprising two pairs of end bearings,

l. one pair of end bearings being disposed near opposite ends respectively of one nut section,

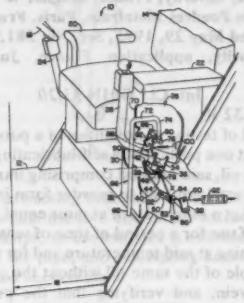
m. the other pair of end bearings being disposed near opposite ends respectively of the other nut section, said bearing means preventing the lateral float movement of the nut sections as permitted by said section biasing means.

4,008,626

LINKAGES FOR MOVING AND RETAINING A CONTROL LEVER TO AND IN A NON-USE POSITION

Gary Lee Schulte, Dubuque, and Edwin Lee Whisler, Peosta, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sept. 10, 1975, Ser. No. 612,188
Int. Cl.² G05G 1/00
U.S. Cl. 74—491 4 Claims



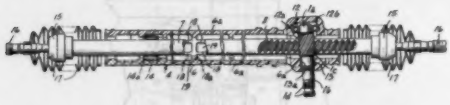
1. In a combination of a control linkage including a control lever mounted for pivotal movement in at least one plane between a neutral position and at least one actuating position, an output member mounted for rotation about a first axis, first motion transmitting means connected between the lever and the output member for causing movement of the latter between neutral and actuating positions corresponding to the neutral and actuating positions of the lever, biasing means connected to the output member for yieldably maintaining the latter in its neutral position, and a safety bar mounted in the vicinity of the lever for pivotal movement in a plane extending generally parallel to the one plane between a normal position disposed free of the control linkage and a locking position engaged with the control linkage for preventing movement of the output member from its neutral position, the improvement comprising: said first motion transmitting means including a first link pivotally connected to a first end of an interlock link having a second end and being pivotally connected between its first and second ends to the output member for movement about a second axis extending parallel to the first axis; a second motion transmitting means connecting the safety bar to the interlock link and including a second link pivotally connected to the second end of the interlock link at a location chosen so as to lie on the first axis when the safety bar is in its normal position; said lever being movable in the first plane to a non-use position; the first and second motion transmitting means and the interlock link being dimensioned and arranged such that movement of the lever when the safety bar is in its normal position will result in movement of the interlock link about the first axis for effecting movement of the output member and movement of the safety bar will result in movement of the interlock link about the second axis for effecting movement of the control lever, the latter movement disposing the control lever in the non-use position when the safety bar is in its locking position; and lock means, including first means fixed for movement with the safety bar and second means fixed for movement with the control lever, disposed for engagement only when the safety bar is in its locking position and the control lever is in its non-use position.

4,008,627

RACK AND PINION UNITS

Kenneth Bradshaw, and James Ernest Buckingham, both of Bristol, England, assignors to Cam Gears Limited, Hitchin, England

Filed July 18, 1973, Ser. No. 380,259
Int. Cl.² B62D 1/20
U.S. Cl. 74—498 19 Claims



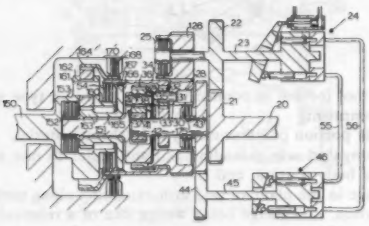
1. A rack and pinion steering gear comprising:
a rack bar carrying a rack;
pinion means including
a shaft,
a pinion on said shaft, and bearing means for mounting said shaft for rotation; and a unitary housing including at least two mating housing shells enclosing said rack bar, said pinion and said bearing means, each of said shells including
first support means slidably mounting said rack bar,
second support means fixedly mounting said pinion assembly with said pinion operatively engaging said rack, and
securing means permanently securing said shells together in a fixed, mated relationship.

4,008,628

HYDROMECHANICAL TRANSMISSION

Elias Orshansky, Jr., San Francisco, Calif., assignor to Orshansky Transmission Corporation, New York, N.Y.

Continuation of Ser. No. 477,082, June 6, 1974, abandoned, Division of Ser. No. 291,803, Sept. 25, 1972, Pat. No. 3,888,139, which is a continuation-in-part of Ser. No. 259,549, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 154,976, June 21, 1971, abandoned. This application Aug. 26, 1975, Ser. No. 607,833
Int. Cl.² F16H 47/04, 57/10, 37/06
U.S. Cl. 74—687 8 Claims



1. In a power transmission having input means and output means, the combination therewith of
two planetary gear trains each having an input member, an output member and a reaction member,
the input member of one said gear train being connectable to said input means, the input members of the two gear trains being interconnected so that both are driven by said input means,
the reaction members of the two gear trains being at all times rotatable and at all times being interconnected so that they are not rotatable relative to each other, and
the output members of the two gear trains being coaxial and rotatable with respect to each other, and
rotary clutch means for separately clutching said output members to said output means.

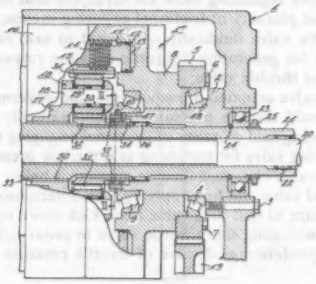
6. In a power transmission having input means and output means, the combination therewith of:
two planetary gear trains each having its own carrier and its own planet, sun, and ring gears, to provide an input member, an output member and a reaction member,
the input member of a first said gear train being a carrier and being connectable to said input means, the input member of a second said gear train being a ring gear and being connected by gear coupling to the carrier of said first gear train, so that both are driven by said input means,
the reaction members of the two gear trains being sun gears mounted on a common reaction shaft,
the output members of the two gear trains being separately clutchable to said output means, the output member of said first gear train being a ring gear,
a stationary casing,
a reduction planetary assembly having a sun gear, a ring gear, and planet gears and a carrier secured to said output means,
driving connection means connecting said ring gear of said first gear train to the sun gear of said reduction planetary assembly,
first clutch means for connecting said carrier of said second gear train to said carrier of said reduction planetary assembly, and
first brake means for connecting said ring gear of said reduction planetary assembly to said stationary casing, to hold that ring gear stationary,
said reduction planetary assembly and said first and second planetary assemblies all being identical to each other as to the sizes and teeth of their gears and carriers.

4,008,629

SUN GEAR RETAINER IN PLANETARY GEARSET

Joseph R. Hoepfl, Greenfield, and Gerardus M. Ballendux, Waukesha, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 3, 1975, Ser. No. 628,523
Int. Cl.² F16H 57/00
U.S. Cl. 74—781 R 10 Claims

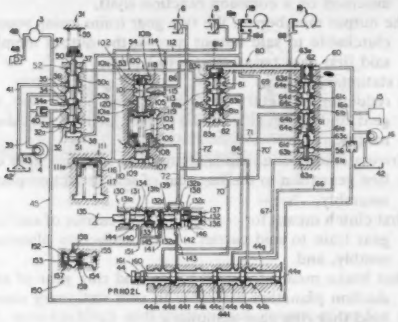


1. A gear and bearing mounting in a transmission comprising, a transmission housing, a mounting sleeve connected to said housing defining a plurality of key slots, a bearing mounted externally on said sleeve, means for retaining said bearing on said sleeve, a second bearing mounted internally in said sleeve, a gear having a supporting flange defining a plurality of keyways and mounted in said sleeve, a plurality of keys mounted in said key slots of said sleeve and said keyways of said supporting flange for absorbing torque transmitted between said sleeve and said gear, fastening means holding said gear axially on said mounting sleeve, shoulders on said keys engaging said mounting sleeve for retaining said keys in said keyways and key slots.

4,008,630
FLUID PRESSURE CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

Noboru Murakami, Nagoya, and Koichiro Hirosawa, Kariya both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sept. 17, 1974, Ser. No. 506,884
Claims priority, application Japan, Sept. 18, 1973, 48-105668
Int. Cl.² B60K 41/18
U.S. Cl. 74—865 4 Claims



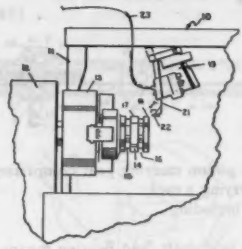
1. A fluid pressure control system for automatic fluid transmission comprising
a fluid pressure source;
a fluid pressure regulating valve for regulating the hydraulic fluid from said fluid pressure source to a particular line pressure;
a plurality of frictional engaging means actuated by said line pressure from said pressure regulating valve for attaining a particular gear ratio within the gear train of said transmission interposed between an input shaft and an output shaft;
a governor valve for governor pressure which is increased or decreased in response to the rotational speed of said output shaft;
a manual shift valve operatively connected to said fluid pressure regulating valve for supplying said line pressure to said plurality of frictional engaging means;
a throttle valve fluidically connected to said manual shift valve for generating a throttle pressure responsive to an engine throttle valve;
a shift valve actuated in response to said governor pressure and said throttle pressure for automatically selectively actuating said plurality of frictional engaging means; and
a reducing valve for supplying said throttle pressure to said shift valve when said throttle pressure is below a predetermined value and for supplying a predetermined threshold pressure to said shift valve upon kick-down operation by non-activating said throttle valve in order not to exceed said predetermined valve of throttle pressure.

4,008,631
MACHINE TOOL

Robert S. Hahn, Northboro; Bruno A. Holmstrom, West Boylston; Arthur F. St. Andre, Marlboro, and David H. Youden, Shrewsbury, all of Mass., assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Division of Ser. No. 544,266, Jan. 27, 1975, which is a continuation of Ser. No. 393,738, Sept. 4, 1973, which is a continuation of Ser. No. 184,162, Sept. 27, 1971, abandoned.
This application Nov. 6, 1975, Ser. No. 629,598
Int. Cl.² B23D 1/00; B23B 3/00; B26D 1/00
U.S. Cl. 82—1 C 1 Claim

1. A process for removing material from a workpiece, comprising the steps of:
a. applying to the workpiece a ceramic tool having a cutting edge,
b. advancing the cutting edge of the tool relative to the workpiece to remove the material,
c. directing a gas flame to the cutting edge of the tool, thus providing hot gas to the said cutting edge for direct heating of the tool with only indirect heating of the workpiece, and

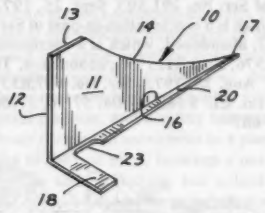


d. maintaining the tool in a range of high temperatures for a period of time, said range of temperatures being independent of whether the tool is cutting or idling during the period, so that the tool does not develop cracks due to wide variations in temperature.

4,008,632
WATCH BAND LINK CONNECTING DEVICE

Joe W. Denney, Hays, Kans., assignor to Walter Moorhouse, Clear Lake, Minn.

Filed Nov. 17, 1975, Ser. No. 632,215
Int. Cl.² B25B 27/22; B21L 21/00
U.S. Cl. 81—3 R 4 Claims



1. A tool for use in connecting links of a link type watchband comprising
a body portion of substantially rigid sheet material,
an elongated arm extending at right angles to one side of said body portion, and
a flange in the plane of said arm extending along said body portion, said flange being wedge like of a relatively narrow width and tapering to a point at its free end.

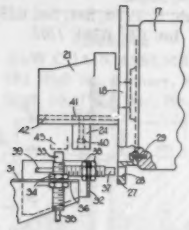
4,008,633
MULTI SPINDLE LATHES

Harold James Gilbert, deceased, late of Coventry, England, by Olive Gilbert, executrix, and Edmund Alexander McConnell, Coventry, England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Sept. 3, 1975, Ser. No. 610,073
Claims priority, application United Kingdom, Sept. 12, 1974, 39743/74
Int. Cl.² B23B 3/34, 3/36, 3/00
U.S. Cl. 82—3 4 Claims

1. In a multi-spindle lathe having a plurality of chucks on the work spindle, the combination comprising:
operating means movable axially of said work spindle for opening and closing a chuck on said spindle;

proximity switch means mounted adjacent said operating means and constructed and arranged to sense changes in the axial position thereof; and



indicating means controlled by said proximity switch means for providing an indication of whether said chuck is opened or closed.

4,008,634

MULTISPINDLE AUTOMATIC LATHE

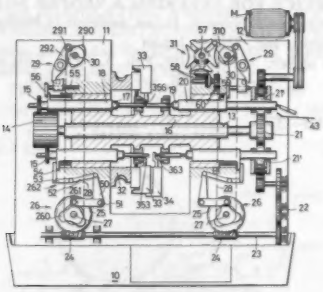
Hermann Flisch, Maienfeld, Switzerland, assignor to Eunipp AG, Zug, Switzerland

Filed Feb. 25, 1976, Ser. No. 661,167

Claims priority, application Switzerland, Mar. 14, 1975, 3274/75

Int. Cl.² B23B *9/04*

U.S. Cl. 82—3 **8 Claims**



1. In an automatic multispindle lathe, a combination comprising a drum having an axis and a pair of opposite end portions; a pair of support means supporting said drum on said opposite end portions for indexing movement about its axis between a plurality of angularly displaced successive work stations; a plurality of spindle sleeves equal in number to said plurality of working stations mounted in each of said end portions of said drum for movement in longitudinal direction; a spindle turnably but axially immovably mounted in each of said spindle sleeves; a plurality of advancing means, one for each of said spindle sleeves; a driven shaft; transmission means between said driven shaft and said plurality of advancing means for driving all of said advancing means from said driven shaft; a plurality of tool slides; and a single tool slide carrier mounted on one of said support means and supporting said plurality of tool slides for movement in radial direction.

4,008,635

MULTI SPINDLE LATHES

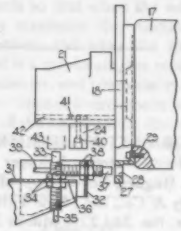
Harold James Gilbert, deceased, late of Coventry, England, by Olive Gertrude Gilbert, executrix, and Edmund Alexander McConnell, Coventry, England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Sept. 3, 1975, Ser. No. 610,072

Claims priority, application United Kingdom, Sept. 12, 1974, 39744/74

Int. Cl.² B23B *19/02, 3/34*

U.S. Cl. 82—30 **3 Claims**



1. In a control system for an automatic lathe the combination comprising:

a gapped ring mounted for rotation with a spindle of said lathe, said ring having a plurality of gaps arranged to follow a circular path as said ring rotates;

a proximity probe positioned adjacent to said circular path and adapted to produce signal pulses in response to passage of said gaps, said pulses being generated without contact between said ring and said probe; and

control means responsive to said signal pulses for inhibiting predetermined functions of said lathe so long as the time between successive ones of said signal pulses is less than a predetermined interval.

4,008,636

RATCHET WRENCH

Alfred W. Wakeman, Madison Road, Durham, Conn. 06422

Filed Apr. 21, 1975, Ser. No. 570,247

Int. Cl.² B25B *13/52*

U.S. Cl. 81—68 **3 Claims**

1. A ratchet wrench for applying unidirectional turning force on a grippable member comprising

an elongated bar of rigid material terminating at one end in a projecting tooth extending transversely thereof adjacent one lateral edge,

a relatively stiff elongated strap including elongated leg portions at either end thereof respectively merging into a U-shaped central portion providing an opening having a width only slightly greater than said bar at said toothed end thereof,

said strap embracing said bar with the respective elongated strap leg portions extending along opposite sides of said bar,

said U-shaped central portion enclosing said bar toothed end to define a closed periphery socket for axial reception of a said grippable member,

means rigidly securing said strap leg portions to said bar along the sides thereof at points spaced a substantial distance from the toothed end of said bar,

said U-shaped central portion of said strap thereby being restricted to limited lateral movement with respect to the said toothed end of said bar, thereby providing a one-way ratcheting action upon a grippable member received therein.

4,008,637

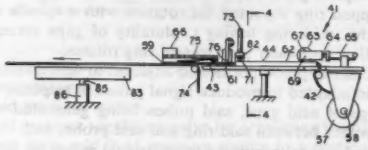
APPARATUS FOR CUTTING HEMMED FABRIC PIECES

Douglas J. Crawford, Waterford; Roger LeMere, Petersburg, and Francis H. Hughes, North Troy, all of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Division of Ser. No. 344,227, March 23, 1973, Pat. No. 3,898,941. This application Apr. 23, 1975, Ser. No. 570,809

Int. Cl.² B26D *5/38*

U.S. Cl. 83—155 **5 Claims**



1. Apparatus for sequentially feeding individual elongated pieces of liner tape of equal length to a path defined by a continuously moving conveyor, characterized by

a. supply means for supplying a continuous length of liner tape;

b. a cutting station for severing said continuous length of liner tape into said elongated pieces to be fed to said conveyor;

c. forward sensing means adjacent the upstream end of said conveyor for sensing the leading edge of said continuous length of liner tape and defining the forward end of said cutting station;

d. cutting means connected to said sensing means for cutting said continuous length of liner tape into said individual elongated pieces;

e. said cutting means defining the rearward end of said cutting station;

f. retractable liner tape advancing means for positively advancing sequentially the leading edge of said continuous length of liner tape in increments to said forward sensing means;

g. said advancing means including a wheel with a non-slip surface for engaging the leading edge of said continuous length of liner tape;

h. reversible power means connected to said advancing means for moving said advancing means;

i. a one-way slip clutch in said wheel preventing rotation thereof while advancing said continuous length of liner tape and allowing rotation while returning over said continuous length of liner tape; and

j. retractable stop means connected to said sensing means for engaging and holding the leading end of said length of liner tape in said cutting station against the reverse movement of said advancing means;

k. said reversible power means retracting said wheel at the same time as the leading end of said liner tape is engaged by said retractable stop means followed by activation of said cutting means.

4,008,638

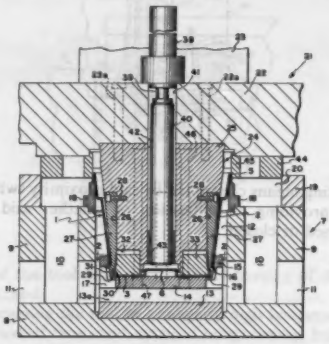
DIE ASSEMBLY FOR FORMING OPENINGS IN WORKPIECES

Frederick O. Miller, Saginaw, Mich., assignor to Miller Mold Company, Saginaw, Mich.

Filed Feb. 5, 1976, Ser. No. 655,499

Int. Cl.² B26F *1/02*

U.S. Cl. 83—185 **16 Claims**



1. A die assembly for forming a bottom and side opening in a cup-shaped container, said assembly comprising a base having a cavity for supporting said container with its bottom at a predetermined level; a plug of such size as to fit within said container; means supporting said plug for movement in a direction into said cavity; a punch carried by said plug for movement with the latter in said direction beyond said level and for movement relative to said plug transversely of said direction; and deflecting means supported in the path of movement of said punch in said direction and responsive to movement of said punch in said direction beyond said level to deflect said punch transversely of said direction.

4,008,639

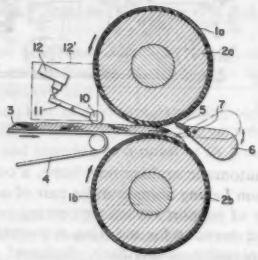
DEVICE FOR SEVERING A VENEER SHEET

Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Ohbu, Japan

Division of Ser. No. 546,605, Feb. 3, 1975. This application Jan. 26, 1976, Ser. No. 652,304

Int. Cl.² B26D *5/38*

U.S. Cl. 83—371 **16 Claims**



1. A device for severing a veneer sheet comprising a veneer sheet feeding means continuously driven and including a pair of roller members adapted to hold a veneer sheet therebetween, a cutter member pivotally disposed on the feed-out side of the veneer sheet feeding means and having an edge portion adapted to work on the side of the fed-in veneer sheet, a means for sensing a preselected condition of said veneer sheet, a means for transmitting a signal in accordance with the sensing of the preselected condition of the veneer sheet, and an actuator for actuating in response to said signal the cutter

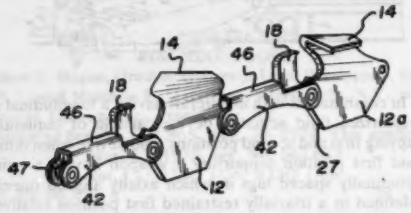
member to pivot and cut the veneer sheet in cooperation with a force by which the veneer sheet is fed, the severed veneer sheets being adapted to be fed out in two different directions which are located on opposite sides of the cutter member.

4,008,640

SAW CHAIN ASSEMBLY

Albert E. Good, 102 High St., Ramsey, N.J. 07446

Filed Sept. 10, 1975, Ser. No. 612,189
Int. Cl.² B27B *33/14*
U.S. Cl. 83—833 **10 Claims**



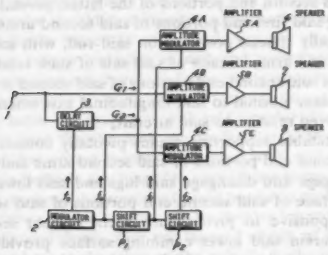
1. A saw chain assembly comprising a plurality of links and a plurality of linking members, hinging means connecting said links and linking members to form a chain, each pair of adjacent links being separated by a linking member and each pair of adjacent linking members being separated by a link, said links including cutting elements and gear elements, said gear elements being constructed and arranged in said chain to engage the drive mechanism of a powered chain saw, wherein each of said linking members comprises two substantially parallel side walls integrally connected by a bridge wall to define a channel between said side walls and extending the entire length thereof, and said hinging means includes means hingedly connecting one end of each of two adjacent links to said side walls and within said channel.

4,008,641

DEVICE FOR MODULATING A MUSICAL TONE SIGNAL TO PRODUCE A ROTATING SOUND EFFECT

Akira Takada, and Tadao Sakai, both of Osaki, Japan, assignors to Roland Corporation, Osaka, Japan

Filed Nov. 20, 1975, Ser. No. 633,909
Claims priority, application Japan, Dec. 7, 1974, 49-141046
Int. Cl.² G10H *1/02*; H04M *1/00*
U.S. Cl. 84—1.24 **5 Claims**



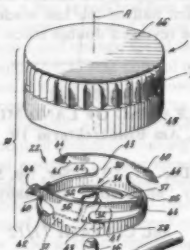
1. A device for modulating a musical tone signal to produce a rotating sound effect comprising an input of a musical tone signal, a first channel coupled to said input and having an amplitude modulator therein, at least two further channels each having an amplitude modulator therein, a delay circuit means coupled between said input and said further channels, a frequency modulation means coupled to said amplitude modulator in said first channel and to said delay circuit means for frequency modulating the musical tone therein, phase shift means coupled between said frequency modulation means and the respective amplitude modulators in said further channels for shifting the phase of the musical tone signals in said channels, and coupling means coupling the outputs of said amplitude modulators and including transducer means for converting the modulated musical tone signals into sound, with the musical tone signal from said first channel being in the center of the reproduced sound and the musical tone signals from the further channels being on opposite sides of the musical tone signal from the first channel, said modulating means, amplitude modulators and phase shift means modulating the signals in the further channels so that when the volume level in one further channel is a maximum the modulated frequency is substantially a maximum, and when the volume level in the other further channel is a maximum, the modulated frequency is substantially a minimum, and when the volume levels of the signals in the further channels are about equal, the volume level and frequency of the signal in the first channel is successively a maximum and a minimum, whereby a rotating sound effect is produced.

4,008,642

FASTENING DEVICE

Phillip D. Becker, Southbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed Jan. 8, 1976, Ser. No. 647,615
Int. Cl.² F16B *37/14*
U.S. Cl. 85—35 **7 Claims**



1. A fastening device, having an axis, for engaging a stud and comprising:

A. a sheet metal nut element including

1. a web portion extending generally perpendicularly to the fastening device axis;
2. means associated with said web portion for engaging a stud;
3. a generally tubular section formed at the periphery of said web portion, extending therefrom in the direction of the fastening device axis and having at least one pair of circumferentially opposing wings which project outwardly away from the fastening device axis, each wing having its major dimension also extending in the direction of the fastening device axis, and

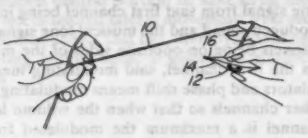
B. a one-piece cap member including,

1. a cover and
2. a nut element embracing skirt, formed at the periphery of said cover extending therefrom in the direction of the fastening device axis, shaped and sized to fit in tight conformity about said tubular section with said wings biting into the inner wall of said skirt in circumferentially opposing directions to prevent relative rotation of said nut element and said cap in either angular direction, said nut element web portion and cap member cover being positioned at opposite margins of said device.

4,008,643
KNOTLESS TATTING

Dora M. Young, 128 Rogers Road, Kittery, Maine 03904

Filed Nov. 24, 1975, Ser. No. 634,873
Int. Cl.[2] D04C 1/00
U.S. Cl. 87—10 2 Claims

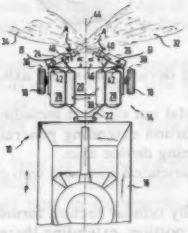


1. The method of making a decorative knot stitch in tatting work with three threads and a shuttle having a bobbin thereon, comprising the steps of:
   a. tying together a pair of threads and winding them evenly about said bobbin,
   b. cutting one of said pair of threads relatively close to the shuttle,
   c. forming a first reversed double stitch from said threads at an even spacing on all threads,
   d. forming a picot from said threads,
   e. forming a second reversed double stitch and joining it to another part of the work adjacent thereto,
   f. repeating the reversed double stitches and picots,
   g. joining the ends to the work,
   h. picking up both threads and passing them through an adjacent picot, slipping the shuttle through the loop, and
   i. joining the first half of the last made knot stitch at the picot and one reversed double stitch.

4,008,644
CLEARING OF LAND MINES

Lutz Tilo Kayser, Am Bismarckturm 10, 7 Stuttgart 1, Germany

Filed Dec. 17, 1974, Ser. No. 533,676
Claims priority, application Germany, Dec. 20, 1973, 2363557
Int. Cl.[2] F41H 11/12
U.S. Cl. 89—1 M 21 Claims

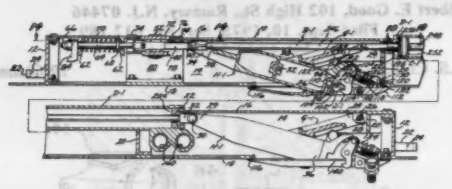


17. An apparatus for clearing land mines, particularly anti-tank mines, comprising a pair of rocket engines each having a thrust nozzle from which a stream of high-velocity gases issues when the engine is in operation; support means for supporting said rocket engines above the surface of an area to be cleared, and for movement over said surface; and mounting means for mounting said rocket engines at spaced locations on said support means so that said thrust nozzles face towards said surface and in mutually opposite directions transverse to the direction of movement of said support means, said rocket engines being arranged on said support means so that the respective gas streams overlap and cross each other in space without physically intersecting each other and thereby impinge at least those portions of the surface lying underneath said support means, to plow the surface up and detonate or dislodge any land mines that are present.

4,008,645
AIRCRAFT SUPPORTED LAUNCHABLE WEAPON RELEASE ASSEMBLY

Donald H. Herbert, 1350 9th St., San Pedro, Calif. 90732

Filed Mar. 22, 1974, Ser. No. 453,827
Int. Cl.[2] F41F 5/02
U.S. Cl. 89—1.5 R 11 Claims



1. In combination with an aircraft having a longitudinal axis a pressurized fluid actuated device capable of sequentially occupying first and second positions, said device when initially in said first position supporting a weapon having a pair of longitudinally spaced lugs in which axially aligned openings are defined in a triaxially restrained first position relative to said aircraft, said device when it is power actuated moving to said second position and concurrently moving said weapon outwardly relative to said aircraft in a path normal to said longitudinal axis to a second position where said weapon is released at a desired velocity in a first direction normal to said longitudinal axis and said weapon when released having a velocity in a second direction parallel to said longitudinal axis that is the same as the velocity of said aircraft, with said pressurized fluid actuated device after moving to said second position automatically returning to said first position, and said pressurized fluid actuated device upon returning to said first position having all of the components thereof occupying the same spaced relationship relative to one another that they initially did when said device was initially in said first position, said device including:
   a. an elongate rigid rod;
   b. first means for slidably supporting said rod from said aircraft parallel to said longitudinal axis;
   c. two longitudinally spaced sets of first and second arms, each of which arms has first and second end portions; said second end portions of said second arms having a lower camming surface of predetermined contour;
   d. second means for pivotally supporting said first end portions of said first arms at fixed positions relative to said aircraft, pivotally connecting said second end portions to said first arms to said second arms intermediate said first and second end portions of the latter, pivotally connecting said first end portions of said second arms to longitudinally spaced positions on said rod, with said first and second arms in each of said sets of such relative lengths that said second end portions of said second arms move in a plane normal to said longitudinal axis when said rod is moved relative to said aircraft;
   e. rotatable supporting means pivotally connected to said second end portions of said second arms and adapted to engage and disengage said lugs and said lower camming surface of said second end portions of said second arms responsive to pivotal movement of said second arms, wherein said lower camming surface provides restraint against release of said lugs when said device is in said restrained first position and disengagement of said rotatable supporting means from said lower camming surface provides release of said lugs when said device is in said second position;
   f. releasable pressurized fluid means that cooperate with said rod to reciprocate the latter to move said device from said first to said second position where said weapon is released and then return said device to said first position; and
   g. spring loaded spray brace means that automatically

contact said weapon to hold said weapon in a triaxially restrained position when said rotatable supporting means are caused to engage said openings in said lugs and said device is in said first position.

4,008,646

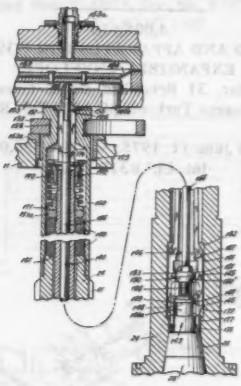
MACHINE TOOLS

Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 501,865, Aug. 30, 1974. This application Mar. 27, 1975, Ser. No. 562,632

Int. Cl.² B23C 5/26; B23Q 1/08

U.S. Cl. 90—11 A 24 Claims



1. A spindle unit for a quick-change machine tool having a spindle body having a tapered socket for seating a tapered shank of a toolholder which has an adapter provided with an external annular shoulder; a drawbar supported in the spindle and having hooks biased to engage said annular shoulder on said adapter; means including a push rod supported in said drawbar for movement therein independently of said drawbar; hook-locking means on said push rob for engaging said hooks to lock the latter in engagment with said annular shoulder on said adapter and thereby lock the toolholder in the spindle socket; drawbar spring means concentric with said drawbar and said spindle body and biased to apply force to the drawbar axially and, through the pressure of said hooks on said annular shoulder of the adapter, to draw the toolholder inwardly of the spindle body and firmly seat the tapered shank of the toolholder in said tapered socket of the spindle body; and toolholder releasing means including a first power operated means acting on the drawbar to move it axially only sufficiently against the force of said drawbar spring means to relieve the pressure of said hooks against said annular shoulder of the adapter while said hooks remain in position to intercept the withdrawal of said annular shoulder on the adapter from said hook, and a second power operated means for operating said push rod to cause said hooks to move out of position to engage said annular shoulder on said toolholder adapter and permit withdrawal of the toolholder from the spindle socket.

4,008,647

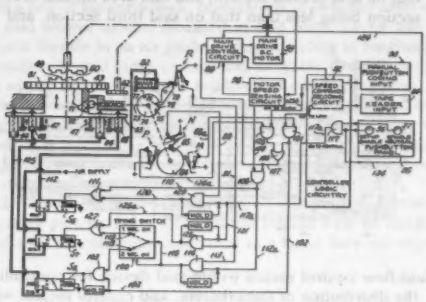
MACHINE TOOLS

Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 501,865, Aug. 30, 1974. This application Apr. 9, 1975, Ser. No. 566,375

Int. Cl.² B23Q 5/12, 3/00

U.S. Cl. 90—11 R 11 Claims



1. A spindle unit for a machine tool having a spindle; means for mounting the spindle for rotation; means for rotating the spindle comprising a motor and change speed means between the motor and the spindle, said change speed means having a high speed position, a low speed position and a neutral position; control means; spring operated means responsive to said control means to move said change speed means to high speed position; means responsive to said control means for reducing the speed of rotation of the motor; first power operated means responsive to said control means for moving said change speed means to neutral position; second power operated means responsive to said control means for moving said change speed means to low speed position; locking means for locking said change speed means in high speed, low speed or neutral positions; means controlled by said control means and responsive to the then position of said change speed means for releasing said locking means; selectively operable means responsive to the release of said locking means for energizing said means for moving the change speed means to low speed position or neutral position, said change speed means including separable interengaging elements, and said means for moving said change speed means to low speed position including timing switch means which discontinues the energization of said second power operated means if, after the lapse of a predeterminate time, said interengaging elements have not been moved into proper interengagement in low speed position, and energizing said second power operated means to move the change speed means to neutral position, said timing switch means being constructed and arranged to cause the change speed means to be again moved, after the lapse of a determinate time, back to low speed position, said successive movements between low speed position and neutral position being repeated until the interengaging elements properly engage in low speed position; and means responsive to the arrival of the change speed means in low speed position for deenergizing said first and second power operated means.

4,008,648

TELESCOPIC RAM

Stanley E. Farmer; Donald M. Faust, both of Gresham, and Harry F. Weinert, Portland, all of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Nov. 11, 1975, Ser. No. 630,781

Int. Cl.² F15B 11/18

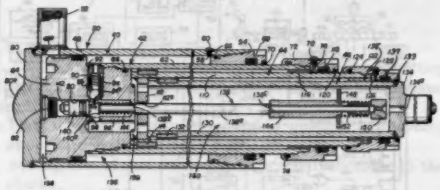
U.S. Cl. 91—168 14 Claims

1. A three-stage, fluid-actuated, extensible-contractible device for an industrial lift truck or the like, comprising

first, second, third and fourth nested, relatively reciprocable sections, said first, second and third sections being extensible from said second, third and fourth sections, respectively,

port means for introducing and exhausting pressure fluid to extend and contract said device, respectively,

means on said first, second and third sections defining working surface areas on which pressure fluid acts to extend said sections, said area on said first section being less than that on said second section, and said area on said second section being less than that on said third section, and



fluid-flow control means within said device for controlling the distribution of fluid therein, said control means, with pressure fluid supplied to said port means at a substantially constant rate, and in cooperation with said areas, producing, during an initial mode of extension of said device, extension of said second section from said third section to cause a certain overall extension speed for said device, and thereafter, and during a later mode of extension producing simultaneous extension of said first section from said second section and of said third section from said fourth section to maintain the overall extension speed of said device substantially constant at said certain speed.

4,008,649

APPARATUS FOR THE PREPARATION OF A CYLINDRICAL CORRUGATED ARTICLE

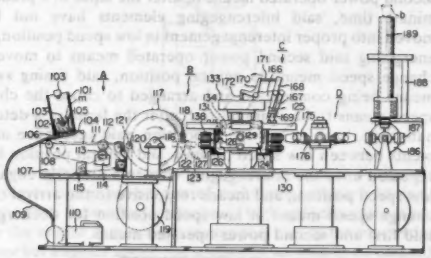
Yukihiro Shikaya, Tokyo, Japan, assignor to Dai Nippon Printing Company Limited, Tokyo, Japan

Filed Feb. 24, 1975, Ser. No. 552,359

Claims priority, application Japan, Mar. 8, 1974, 49-26872; Mar. 14, 1974, 49-29505

Int. Cl.² B31C 7/04

U.S. Cl. 93—36.2 **10 Claims**



1. An apparatus for manufacturing a cylindrical corrugated article, comprising:

1. forming means comprising a pair of rotatable rolls, namely first and second forming rolls, which are rotatable in opposite directions, said rolls having interlocking corrugated surfaces, a heating member provided inside at least one of said rolls, and the corrugated surface of the first forming roll being provided with grooves formed in the circumferential direction thereof;

2. supply means for supplying a sheet material between said pair of rolls to cause corrugation of the sheet material by pressing it with the corrugated surfaces of said first and second forming rolls as they rotate to form a corrugated cylindrical article;

3. means for rotating said rolls when the corrugated surfaces are interlocking;

4. guide means for preventing the corrugated article resulting from the corrugation of the sheet material from coiling around the first forming roll and for causing the corrugated article to coil around the circumference of the second forming roll, said guide means including ringlike guide plates which surround the circumference of the second forming roll and are slightly spaced therefrom so that the corrugated article coils around the second forming roll within the ringlike guide plates, said guide plates having fore ends disposed within the grooves of the first forming roll and facing in a direction which is opposite to the direction of rotation of said first roll so that said plates prevent the corrugated article from coiling around the first roll;

5. means for disengaging said second forming roll with the corrugated article mounted thereon from said first forming roll; and

6. means for discharging the corrugated article from the second forming roll after it has been disengaged from the first forming roll.

4,008,650

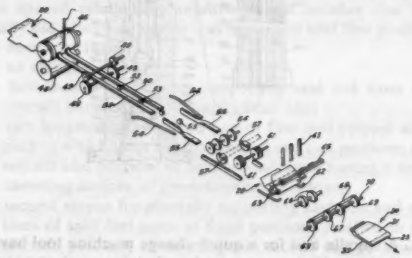
METHOD AND APPARATUS FOR FORMING EXPANSIBLE ENVELOPE

Seymour B. Alter, 31 Brionfield Drive, Great Neck, N.Y. 11020, and Eugene Turkenkopf, 1323 Taft Road, Teaneck, N.J. 07666

Filed June 11, 1975, Ser. No. 586,099

Int. Cl.² B31B 29/26

U.S. Cl. 93—62 **4 Claims**



1. The method of forming an expansible envelope into a substantially flat condition from a precut one-piece blank of sheet material having adhesive applied to the top edge of the blank comprising:

a. scoring the blank to define

i. rear, bottom and front panels interconnected along generally parallel longitudinal hinge score lines;

ii. gusset flaps connected to the sides of the front and rear panels along transverse hinge score lines;

iii. bottom gusset panels connected to the ends of the bottom panel along transverse hinge score lines and the ends of the gusset flaps adjacent the bottom panel along longitudinal hinge score lines;

iv. a median longitudinal hinge score line running through the bottom panel and the bottom gusset panels;

v. adhesive flaps connected to a gusset flap on each side of the blank along transverse hinge score lines, said adhesive flaps each having an extension at one end running to the said median longitudinal hinge line and being connected along a hinge score line to its adjacent bottom gusset panel; and

vi. a closure panel connected to the top of the rear panel along a longitudinal hinge score line;

b. folding inwardly the gusset flaps, the adhesive flaps and their extensions, and the bottom gusset panels;
c. reverse folding outwardly the adhesive flaps and their extensions over the adjacent gusset flaps;
d. applying adhesive along the top surfaces of only the adhesive flaps with the bottom panels being free of adhesive;
e. folding the blank along the median longitudinal hinge score line to superimpose the front and rear panels, the adhesive flaps and the gusset flaps, and the adjacent portions of bottom gusset panels, the folding of the blank along the median longitudinal hinge score line comprising turning the leading edge of the blank upward, holding the blank in the gusset area adjacent the said median score line, and moving the blank under pressing means to direct the front panel backward to superimpose the front panel over the rear panel; and

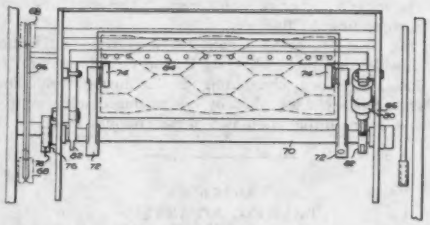
reverse folding the closure panel over the front panel.

4,008,651

METHOD AND APPARATUS FOR THE FORMATION OF TUBULAR CONTAINERS FROM BLANKS

John Herbert Pain, Weybridge, England, assignor to John Waddington Limited, England

Filed May 7, 1975, Ser. No. 575,222
Int. Cl.² B31C *1/00*
U.S. Cl. 93—81 R **9 Claims**



1. A method of constructing a non-cylindrical tubular container from a blank creased to delineate cells, comprising the steps of

1. providing a mandrel having a non-cylindrical contoured surface conducive to initiating folding of the blank about its creases,
2. causing a first edge which is to extend lengthwise of the container to be held in fixed relationship on the mandrel,
3. wrapping the blank around the mandrel to cause the blank to fold about its creases and take a tubular shape,
4. causing a second lengthwise edge of the blank to overlap the first lengthwise edge of the blank, and
5. causing the overlapped edges to be joined together by pinching the overlapped edges together between a presser bar and the contoured surface of the mandrel.

4,008,652

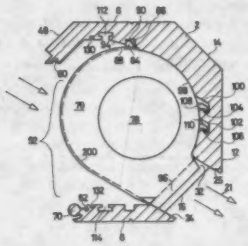
VENTILATING DEVICE

Heinz Georg Baus, Ulmenweg 46, Thun, Switzerland (CH-3601)

Filed Mar. 6, 1975, Ser. No. 555,951
Claims priority, application Germany, Mar. 8, 1974, 2411053
Int. Cl.² F24F *13/10*
U.S. Cl. 98—39 **21 Claims**

1. Ventilating device comprising an outer casing formed of a casing part having a forward side formed with an opening, and a lid articulatingly connected to a lower forward edge of said casing part, partly defining said opening, said outer casing being installable in a window frame, said outer casing being elongated and having a substantially uniform cross section over the entire length thereof, said casing part, in a rearward lower region thereof being formed with openings, said outer casing in closed condition of said lid and said casing part having a multi-sided outer cross section with upper and lower horizontal surfaces engageable by correspondingly wide surfaces of a window frame, with a forward vertical surface entirely and a lower forward inclined surface at least partly formed by said lid and with a lower rearward inclined surface wherein said openings are formed, including a blower motor and a pair of blower wheels, respectively at opposite axial ends of said blower motor, mounted in said outer casing and enclosed therein in an air guide casing extending in longitudinal direction of said outer casing, said air guide casing having in an upper region thereof a relatively short holding strip and being inwardly resilient in said region so as to snap said holding strip into engagement in a groove formed in the inner wall surface of said casing part, said casing part having a forwardly inclined inner wall surface extending from said snap-in groove in direction toward the lid opening.

2. Ventilating device comprising an outer casing formed of a casing part having a forward side formed with an opening, and a lid articulatingly connected to a lower forward edge of



said casing part, partly defining said opening, said outer casing being installable in a window frame, said outer casing being elongated and having a substantially uniform cross section over the entire length thereof, said casing part, in a rearward lower region thereof being formed with openings, said outer casing in closed condition of said lid and said casing part having an octagonal outer cross section wit upper and lower horizotal surfaces engageable by correspondingly wide surfaces of a window frame, with a forward vertical surface entirely and both forward inclined surfaces at least partly formed by said lid and with a lower rearward inclined surface wherein said openings are ormed, including a blower motor and a pair of blower wheels, respectively at opposite axial ends of said blower motor, mounted in said outer casing and enclosed therein in an air guide casing extending in longitudinal direction of said outer casing, said air guide casing having in an upper region thereof a relatively short holding strip and being inwardly resilient in said region so as to snap said holding strip into engagement in a groove formed in the inner wall surface of said casing part, said casing part having a forwardly inclined inner wall surface extending from said snap-in groove in direction toward the lid opening.

4,008,653

DIFFUSER

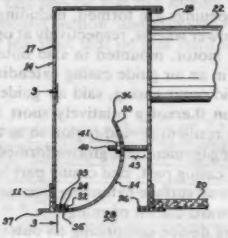
Walter A. Tatham, Tucson, Ariz., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 4, 1974, Ser. No. 529,356
Int. Cl.² F24F *13/08*
U.S. Cl. 98—40 D **4 Claims**

1. A diffuser for controllably discharging air into a room through an elongated ceiling opening comprising:

a. a plenum adapted to be supported above said ceiling over said ceiling opening, said plenum including means for receiving conditioned air to be distributed to said room.
b. said plenum having an elongated opening for alignment with said elongated ceiling opening;

c. an elongated sheet mounted in said plenum, said sheet extending the length of, and being supported along, and in continuous contact with said elongated opening and having an edge positioned below said elongated opening and extending along said ceiling opening, said sheet including a continuously curved convex surface extending upwardly from said edge into said plenum;



d. means preventing air in said plenum from flowing over other than the convex surface through said elongated ceiling opening; and

e. said sheet forming a continuous air guiding surface extending from within said plenum to a position at least even with said ceiling.

4,008,654

ADJUSTABLE AIR BLADE FOR AIR HANDLING LUMINAIRES

Leo G. Stahlhut, Kirkwood, and Walter J. Trantina, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed June 4, 1975, Ser. No. 583,702
Int. Cl.² F24F *13/02*
U.S. Cl. 98—40 DL **11 Claims**

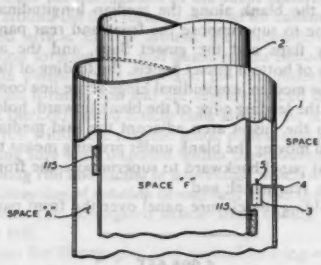
1. In a lighting fixture including a body, said body having a peripheral lip, said lip having a plurality of openings in it for permitting passage of air through said lip, a wall extending from said lip, said wall defining a lamp housing, said lamp housing having an open side for insertion and removal of an energizable electrical light source, and means for at least partially closing the open side of said lamp housing, said closing means lying inboard of said lip, the improvement which comprises an air blade mounted between said closing means and said lip, said air blade including a first side and a second side, said first side having at least one relief means formed in it, said relief means enabling said first side to move with respect to said second side between at least a first position and a second position, said first side adapted to close the openings in said lip in said first position, said first side and the openings in said lip being spaced from one another in said second position.

4,008,655

METHOD AND APPARATUS FOR PROTECTING A DOUBLE-SHELLED CHIMNEY STACK

Syed A. Rahman, 329 E. Shore Trail, Sparta, N.J. 07871

Filed Nov. 17, 1975, Ser. No. 632,213
Int. Cl.² E04F *17/04*
U.S. Cl. 98—46 **15 Claims**



1. An improved chimney stack of the type having at least one flue, through which flue gases flow, and an outer shell, for establishing an insulating space surrounding the flue, wherein the improvement comprises:

a. heat exchanger means, secured to the flue and having a first port and a second port;

b. the first port extending through the outer shell and communicating with outside air;

c. the second port communicating with the insulating space surrounding the flue; and

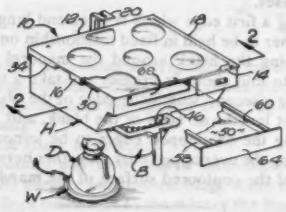
d. the heat exchanger means for admitting and heating outside air, and discharging heated outside air into the insulating space surrounding the flue during cooldown of the chimney stack, thereby minimizing condensation of flue gases during cooldown of the chimney stack.

4,008,656

BREWING APPARATUS

Helmut J. Gruner, Brea, Calif., assignor to Farmer Bros. Co., Torrance, Calif.

Filed Oct. 1, 1975, Ser. No. 618,712
Int. Cl.² A47J *31/00*
U.S. Cl. 99—298 **6 Claims**



1. A brewing apparatus comprising a housing means for installation under a shelf-like member;

a normally empty water receiver assembly in said housing having electrical heating means disposed therein;

means for manually introducing a predetermined amount of water into said water receiver assembly including a water inlet drawer slidably mounted on said housing and having a sloping bottom from which a charge of water is cascaded into said water receiver assembly;

temperature-sensitive discharge valve means supported in said receiver assembly including a snap acting bi-metallic diaphragm to discharge water at a predetermined temperature; and

a seal ring engaged by the periphery of said diaphragm when

in the closed position, said seal ring defining a controlled leakage groove therein to permit a predetermined amount of water to pass prior to said water reaching that temperature at which said valve opens.

4,008,657

APPARATUS FOR ADJUSTING TEMPERATURE OF SEMIFLUID FOOD AND SUCCESSIVELY SUPPLYING THE SAME

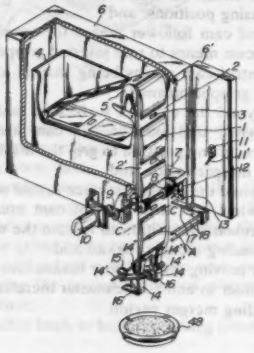
Harukiti Yamamura, Ashiya; Takeharu Karatsu, Kobe, and Yoichi Fukuhara, Nishinomiya, all of Japan, assignors to Kawatetsu Metrological Equipment and Vending Machine Company, Ltd., Nishinomiya, Japan

Filed June 2, 1975, Ser. No. 582,725

Claims priority, application Japan, July 17, 1974, 49-81195

Int. Cl.² B67C *9/00*

U.S. Cl. 99—483 **5 Claims**



1. An apparatus for adjusting the temperature of semifluid food and successively supplying the same, comprising a constant temperature casing including an outer cover enclosing said casing and having a delivery opening, said casing capable of preserving a belt including a number of retort packs each containing a given amount of semifluid food at a temperature suitable for giving relish to said semifluid food, said retort packs being arranged along the length of the belt spaced inward of the edges thereof and spaced apart one from the other by a given distance, means for feeding said belt from said constant temperature casing and directing said belt in a downwardly generally vertical direction toward the delivery opening incrementally every time said semifluid food is demanded, cutter means arranged directly below the constant temperature casing in the vicinity of the delivery opening and capable of severing the belt along the upper edge portion of a retort pack, means for clamping one edge of the belt at least during the operation of said cutter means and including means for turning said opened retort pack upside down to permit gravity flow of the contents thereof, said clamping means operable to release the emptied retort pack.

4,008,658

APPARATUS FOR RECEIVING AND COMPACTING WASTE MATERIAL

Arthur J. Stock, Lakewood, and Donald E. Christofer, Willowick, both of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Filed Mar. 26, 1975, Ser. No. 562,060

Int. Cl.² B30B *1/32*, *15/04*

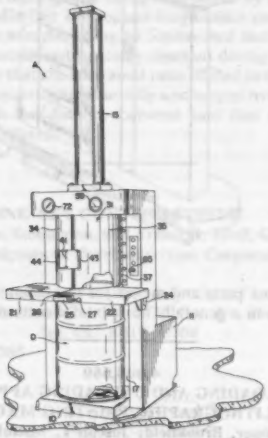
U.S. Cl. 100—53 **10 Claims**

1. Apparatus for receiving and compacting waste material and for capturing particles generated during the receiving and compacting operations and subject to being dispersed in the surrounding atmosphere, comprising:

a main body for receiving and supporting a waste receptacle, and defining a loading chamber above said receptacle,

means defining an enclosure movable between an operating position within said loading chamber and a retracted position outside of said loading chamber to afford access to the interior of said loading chamber,

a power ram having a compacting portion reciprocable in said loading chamber and in said receptacle between a



retracted position outside of said loading chamber and an extended position inside of said receptacle, for compacting material in said receptacle, and

means for expelling atmosphere from said loading chamber and receptacle and from said enclosure when it is within said loading chamber and for introducing clean replacement atmosphere to remove particles dispersed in the atmosphere in said receptacle, loading chamber and enclosure during the compacting operation.

4,008,659

FRAME FOR PRESSES AND SIMILAR MACHINES

Sten Trolle, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Aug. 8, 1975, Ser. No. 603,017

Claims priority, application Sweden, Aug. 30, 1974, 7411039

Int. Cl.² B30B *15/04*

U.S. Cl. 100—214 **9 Claims**

1. A frame for presses, and similar machines, which in the operational state of the machine forms a closed loop and which in the passive state of the machine may be opened so as to permit or facilitate the insertion or removal of workpieces to be treated between tools carried thereby, comprising:

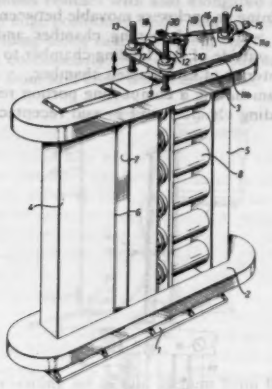
a horizontal bottom frame portion;

at least two spaced vertically extending frame parts permanently secured to said horizontal bottom frame portion and including means for carrying said tools with a workpiece receiving space therebetween;

a horizontal top portion movable between an operative position, in which it is operatively engaged with the tops of the vertically extending frame parts, and an open position in which the opening of the space formed between said tools is accessible; and

opening means coupled at least to said frame top portion to shift said frame top portion into its open position, and

including means for first raising said frame top portion out of engagement with the tops of said vertically extending frame parts and means for displacing said frame top portion in a generally horizontal direction.

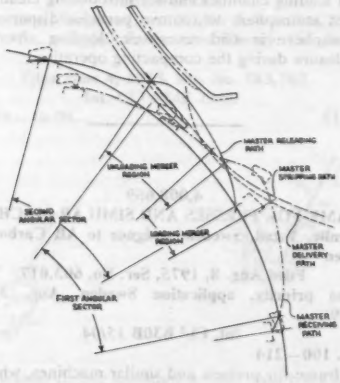


4,008,660

MASTER LOADING AND UNLOADING APPARATUS FOR A LITHOGRAPHIC PRINTING MACHINE

Clinton Hooper, Brookfield; Joseph F. Miciukiewicz, Trumbull; Philip Pollak, Jr., Westport, and John W. Bach, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 8, 1975, Ser. No. 566,145
Int. Cl.² B41F *7/00, 21/04*
U.S. Cl. 101—132 **6 Claims**



1. In a lithographic printing machine having a rotatable master cylinder for holding an imaged master of sheet materials thereon, means for applying printing fluids to the master, and means for receiving an impression from the printing fluids applied to the master; an apparatus for loading the master onto and unloading the master from the cylinder comprising:

A. gripper means external to a cylinder for gripping an edge of a master, movable through a master delivery path into the proximity of the cylinder to deliver the master edge;

B. gripper means mounted internally in the cylinder to rotate therewith, for gripping a master edge delivered into proximity of the cylinder and for later releasing the master edge, said internal gripper means being extendable beyond a surface of a cylinder,

during a first angular sector of cylinder surface rotation to describe a master receiving path that intersects the master delivery path in a loading merger region, and

during a second angular sector of cylinder surface rotation to describe a master release path, the second angular sector coinciding at least in part with said first angular sector of said cylinder rotation;

C. stripper means for unloading the master from the cylinder, movable into proximity of the cylinder to define a master stripping path that intersects the master release path in an unloading merger region;

D. means for actuating said external gripper means to grip a master edge, deliver the master edge to and release the master edge in the loading merger region;

E. means for selectively actuating said internal gripper means to extend beyond the cylinder surface comprising

load control cam means mounted for pivoted movement between master receiving and master releasing positions, said cylinder being mounted to rotate relative to said cam means when in the master receiving and master releasing positions, and

load control cam follower means for coupling said load control cam means to said internal gripper means, said load control cam means being shaped to actuate said internal gripper means to

extend beyond the cylinder surface in said first angular sector when said load control cam means is in the master receiving position to grip the master edge in the loading merger region and

extend beyond the cylinder surface in said second angular sector when said load control cam means is in said master releasing position to release the master edge in the unloading merger region; and

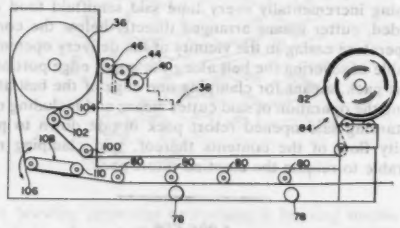
F. means for moving said stripper means into the proximity of the cylinder to unload the master therefrom released in the unloading merger region.

4,008,661

PRINTING PRESS FOR USE WITH BAG-MAKING MACHINES

Robert D. Mathis, Metropolis, Ill., assignor to In-Line Equipment Company, Inc., Belknap, Ill.

Filed Mar. 20, 1975, Ser. No. 560,319
Int. Cl.² B41F *13/02, 5/06, 23/04*
U.S. Cl. 101—181 **25 Claims**



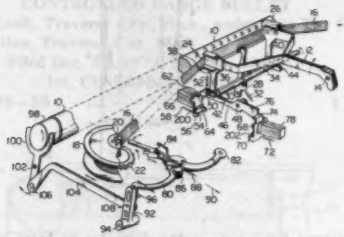
1. A printing press for use with an adjacent machine having a demand for web from a supply, said press comprising a frame supporting a printing head thereon, means including a rotary drum backing said web at said printing head for feeding said web from said supply to said printing head and then to said machine, and means responsive to the tension of said web after it passes said drum for controlling the speed of said feeding means, and for varying the speed of said drum, to vary the rate at which said web is fed from said supply to said printing head and then to said machine in accordance with demand of said machine for said web.

4,008,662

PRINTER RIBBON DRIVE APPARATUS

Mitsuhiro Sato, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1976, Ser. No. 665,644
Claims priority, application Japan, Mar. 10, 1975, 50-28080; Mar. 13, 1975, 50-29491
Int. Cl.² B41J 35/10; B41F 31/16
U.S. Cl. 101—336 11 Claims



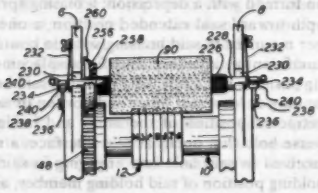
1. A printer ribbon drive apparatus, comprising:
a rotatable type member;
a rockable ribbon guide;
a rockable setting lever connected to the ribbon guide so that rocking movement of the setting lever produces rocking movement of the ribbon guide, the setting lever and ribbon guide being rockable from a first set position through a second set position to a reset position;
a spring urging the setting lever and ribbon guide to the reset position;
a first releasable latch to hold the setting lever in the first set position;
a second releasable latch to hold the setting lever in the second set position;
a printing hammer;
a rotary shaft formed with a hammer actuating projection to engage with the printing hammer upon rotation of the shaft to move the printing hammer toward the type member; and
a setting projection formed on the shaft to engage with the ribbon guide in the reset position upon rotation of the shaft and move the ribbon guide and setting lever to the first set position;

4,008,663

DOCUMENT IMPRINTER

Edward C. Marshall, Upper Montclair, and Myron D. Goldman, Clifton, both of N.J., assignors to Litton Business Systems, Inc., Belleville, N.J.

Filed Nov. 11, 1974, Ser. No. 522,957
Int. Cl.² B41F 31/00
U.S. Cl. 101—349 15 Claims



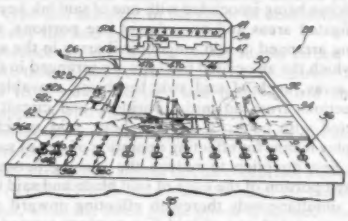
1. In a document imprinter having printing means; a roller cooperable therewith, said roller being mounted for rotation about a longitudinal axis; and drive train means for rotating said roller about said axis, said drive train means comprising:
first and second rotary drive train members mounted for rotation at a given rotational ratio about respective first and second longitudinal axes, the distance between said first and second longitudinal axes being changeable;
said drive train members peripherally engaging each other in driving-driven relationship;
the periphery of one of said drive train members being substantially deformable radially inwardly in response to its engagement by said other drive train member, the amount of deformation being determined by the distance between said first and second longitudinal axes, said one drive train member being so constructed that its circumference remains substantially constant during such deformation, so that the rotational ratio of said two drive train members remains substantially unchanged irrespective of changes in the distance between said first and second longitudinal axes.

4,008,664

INK KEY CONTROL SYSTEM

James N. Crum, Stonington, and Ernest H. Treff, Groton, both of Conn., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Continuation of Ser. No. 381,908, July 23, 1973, abandoned.
This application Mar. 24, 1975, Ser. No. 561,418
Int. Cl.² B41F 31/04
U.S. Cl. 101—365 2 Claims



1. An apparatus comprising a printing press having an ink fountain assembly, said ink fountain assembly including a blade with a longitudinally extending edge, an inker roll disposed on one side of said blade closely adjacent to said longitudinally extending edge, an ink key station disposed on a side of said ink fountain blade opposite from said inker roll, and a plurality of adjustable ink keys disposed in a generally horizontal array at said ink key station for varying ink film thickness along said roll, each of said ink keys being associated with a portion of the longitudinally extending edge of said blade and being operable in a first direction to effect movement of the associated portion of the longitudinally extending blade edge in a direction toward said inker roll and away from said ink key station to decrease the thickness of the ink film applied to the inker roll at the associated portion of the edge of said blade and being operable in a second direction to effect movement of the associated portion of the longitudinally extending edge of said blade in a direction away from the inker roll and toward said ink key station to increase the thickness of the ink film applied to the inker roll at the associated portion of the edge of said blade, an inspection table disposed at a location remote from said ink key station and having surface means for supporting stock on which an image was printed by said printing press, said surface means having a plurality of elongated areas each of which is associated with one of said ink keys and a portion of the edge of said blade and is at least partially disposed beneath an associated portion of the image on the stock supported on said table, each of said elongated areas of said surface means being arranged along a transverse axis extending perpendicular to longitudinal axes of said elongated areas in the same order as in which the associated ink keys are arranged in their horizontal array, an operator's station disposed adjacent to first end portions of

said elongated areas, display means disposed adjacent to second end portions of said elongated areas opposite from said first end portions of said elongated areas to enable said surface means to support the stock at a location intermediate said operator's station and said display means, said display means including means for displaying a unitary visual image representative of the shape of the space between the longitudinally extending edge of said blade and said inker roll as viewed by an operator at said ink key station and looking downwardly at said ink fountain, said unitary visual image including a horizontal straight line representative of the outer surface of the inker roll and a plurality of line portions disposed in a generally horizontally extending array beneath said straight line, each of said line portions being associated with one of said ink keys and being spaced downwardly from said straight line by a distance which is a function of the distance which the portion of the longitudinally extending edge of said blade associated with said one ink key is spaced apart from the surface of said inker roll, said line portions being arranged in said generally horizontal array in the same order as in which the associated ink keys are arranged in their horizontal array, and control means for effecting operation of said ink keys to vary the spacing between the longitudinally extending edge of said blade and said inker roll and for simultaneously therewith effecting activation of said display means to vary the spacing between said line portions and said straight line, said control means including a plurality of switches disposed at said operator's station in a longitudinal array extending generally parallel to said transverse axis of said elongated areas, each of said switches being associated with one of said ink keys, one of said elongated areas and one of said line portions, said switches being arranged in said longitudinal array in the same order as in which the associated ink keys are arranged in their horizontal array, each of said switches being movable in opposite directions from an initial position, and circuit means connected with each of said ink keys, said switches and said display means for effecting operation of one of said ink keys in the first direction to reduce the spacing between the associated portion of the edge of said blade and said inker roll and for simultaneously therewith effecting upward movement of the associated one of said line portions toward said straight line in response to movement of the associated one of said switches in one direction from its initial position, said circuit means being operable to effect operation of one of said ink keys in the second direction to increase the spacing between the associated portion of the edge of said blade and said inker roll and for simultaneously therewith effecting downward movement of the associated one of said line portions away from said straight line in response to movement of the associated one of said switches from said initial position in a direction opposite from said one direction.

4,008,665

TRAINING AMMUNITION

Heinz Gawlick; Rudolf Stahlmann, and Ernst Jensen, all of Furth, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

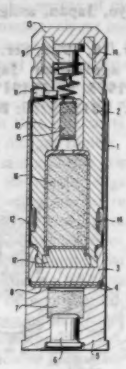
Filed Aug. 28, 1974, Ser. No. 501,357

Claims priority, application Germany, Sept. 6, 1973, 2344939

Int. Cl.² F42B 9/20

U.S. Cl. 102—41 **35 Claims**

1. Training ammunition comprising a projectile disposed in a cartridge case for impingement on a target, said projectile having a rear portion with an axially extending recess and charge means disposed therein, cover cap means for obtaining a substantially uniform and complete seal between a training projectile utilizing small amounts of propellant charge relative to corresponding live ammunition and a barrel means through which it is fired to thereby aid the external ballistics of said projectile, said cover cap means extending over the rear portion of said projectile in a formfitting manner, and obturation means disposed proximate to said cover cap means, said cover



cap means having an outer diameter at least equal to the caliber of said projectile.

4,008,666

PERCUSSION IGNITER

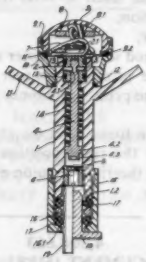
Paul Beermann, Lendringsen, and Wilhelm Grosse-Benne, Menden, both of Germany, assignors to Hagenuk & Co. GmbH, Menden-Lendringsen, Germany

Filed Feb. 25, 1975, Ser. No. 552,783

Claims priority, application Germany, Feb. 26, 1974, 7406694

Int. Cl.² F42C 15/00

U.S. Cl. 102—70 R **9 Claims**



1. A watertight and corrosion-resistant percussion igniter comprising a housing; a percussion cap in said housing; a firing pin mounted in said housing for displacement between a retracted position remote from, and an extended position at, said percussion cap and having one end portion adapted to impact the latter in said extended position and another end portion formed with a depression; a biasing spring urging said firing pin toward said extended position; a one-piece holding member mounted in said housing so as to contact the same at a circumferential interface and for displacement between a holding position and a releasing position, said holding member surrounding at least said other end portion of said firing pin in said retracted position of the latter and having at least one transverse hole that opens at said interface; a retaining member received in said hole and engaging in said depression in said holding position of said holding member, and disengaging said firing pin for displacement toward said extended position thereof in said releasing position of said holding member; and means for sealing said interface both in said holding and said releasing position of said holding member, including a first sealing ring at said interface to one side from said retaining member and preventing fluids from penetrating through said

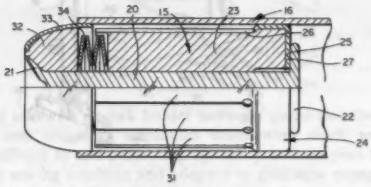
interface toward said retaining member and said percussion cap in said holding position of said holding member, and a second sealing ring at said interface to the other side from said retaining member and preventing fluids from penetrating through said interface toward said percussion cap in said releasing position of said holding member.

4,008,667

CONTROLLED RANGE BULLET

Lance G. Look, Traverse City, Mich., assignor to The L.O.M. Corporation, Traverse City, Mich.

Filed Dec. 13, 1973, Ser. No. 424,461
Int. Cl.² F42B *13/00, 13/32*
U.S. Cl. 102—88 **1 Claim**



1. In a controlled range bullet: an elongated retainer;
first and second stop plates respectively disposed on opposite ends of said retainer;
a cylindrically shaped, elongated body surrounding and slidably mounted on said retainer;
a brake mounted on the body for movement therewith, the brake having a wall and a base, the base being engaged with one end of said body and the wall surrounding the periphery of said body and providing for the body to be fitted inside of a casing and the wall being formed with a plurality of slits each slit terminating in an enlarged hole the holes being located adjacent to said base, the portion of the wall between each pair of adjacent slits forming a brake arm with the root of the arm formed by the area between the holes of the pair of adjacent slits and when the bullet is fired from the muzzle of a gun which causes the bullet to spin, the centrifugal force acting on each arm developing a moment at the root of the arm whereby each arm rotates outwardly about its root and extends generally radially of the body the effect of the arm being to act as a rotary aerodynamic brake;
an annular shaped nose surrounding and mounted on said retainer;
a nose cup mounted on said nose;
an annular compression spring surrounding said retainer and extending between the nose and body, the spring, when the bullet is in the unfired condition, operating to cause the nose to engage said first stop plate and the body to engage said second stop plate and the engagement of the nose with the first stop plate causing the nose cup to be spaced from said arms in a direction to avoid interference with said rotation of the arms; and
upon being fired from the muzzle of a gun which imparts rotation to the bullet, the bullet functioning as follows:
a. the explosive forces acting on the body and the retainer causing the body and the retainer to relatively move in a direction so that the spring is compressed and wherein the nose cup overlies said arms and prevents said arm rotation; and
b. when the effect of the explosive forces is sufficiently dissipated, the force of the spring acting on the body and the retainer causing the body and retainer to relatively move in a direction wherein the nose cup is spaced from the arms to avoid interference with said arm rotation.

4,008,668

ELECTRIC CIRCUIT FOR SELF-PROPELLING TROLLEYS IN STORAGE INSTALLATIONS

Alain Goussard, Louviers, France, assignor to Construction Mills-K, France

Filed Apr. 21, 1975, Ser. No. 570,329
Claims priority, application France, Feb. 20, 1975, 75.05265
Int. Cl.² B60M *1/00*
U.S. Cl. 104—88 **5 Claims**

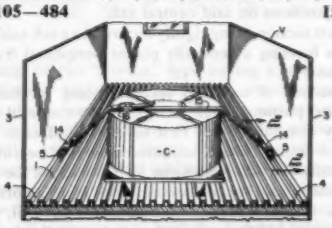
1. A system of remote control and power supply circuits for a self-propelling electric trolley supplied by means of a cable and having its own automatic operating means, which has to perform a certain number of operations whilst moving relative to a fixed or movable reference station, and said trolley being equipped with pick-off elements and end of travel detectors, as well as translation and load-manipulating motors of the three-phase type and sensitive to the order of connecting the phases, whereby the said system has :
on the reference station : a fixed power supply circuit supplied with three-phased current and a fixed control circuit for said fixed power supply, said fixed control circuit being supplied with single-phase current,
and, on the trolley a mobile supply and control circuit for three-phased electric motors,
wherein said fixed power supply circuit comprises a time lag contact (STT1, FIG. 3) in series with one of the phases in order that, when the three phase power is applied, one of the phases is energized with a delay with respect to the energizing of the two other phases,
wherein said fixed control circuit comprises a relay (STT, FIG. 4) which is energized when the three phase power is applied and which controls said time lag contact,
and wherein said movable circuit comprises a control memory relay (53 or 54, FIG. 5) supplied by the two simultaneously energized phases and motor control relays (55, 56, MC) supplied by the time lagged phase and one of the two other phases.

4,008,669

RESILIENTLY BIASED TIE-DOWN ANCHOR

Robert Earl Sumrell, 2069 State Road W., Warren, Ohio 44481

Filed Nov. 28, 1975, Ser. No. 635,847
Int. Cl.² B60P *7/04, 7/12;* **B61D** *17/10, 45/00*
U.S. Cl. 105—484 **15 Claims**



1. A cargo tie-down apparatus for a refrigerated van and the like having a longitudinally grooved floor supported by transverse flanged beams therebeneath, said apparatus comprising

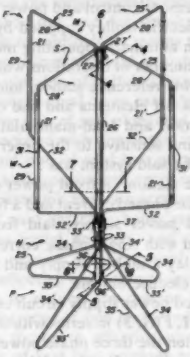
a flexible strap assembly positioned over cargo on said floor and having downwardly extending end portions secured to anchoring means on said floor; at least one of said anchoring means comprising an eye bolt having an eye at its upper end and having a shank extending downwardly through a hole in a floor groove and through the flanges of one of said beams; and eye bolt retaining means to permit limited vertical movement of said eye bolt from a lowered position in said floor groove to an elevated position whereat one end portion of said strap assembly is engaged with said eye.

4,008,670

FOLDABLE SAMPLE DISPLAY TABLE

Raymond C. Price, 756 S. Jason St., Denver, Colo. 80225

Filed May 21, 1975, Ser. No. 579,464
Int. Cl.² A47B *41/04*
U.S. Cl. 108—28 5 Claims



1. A foldable display rack of the type having two peripheral frame sections of similar size and shape foldable along a vertical axis generally centrally of said two sections comprising:
   a. the first of said two sections being rod-formed including straight opposed portions rigidly depending radially from a first position on said central axis, normal portions depending from the ends of said straight opposed portions forming parallel sides arranged to be vertical in use for hanging displays therefrom, inwardly directed portions extending from the opposed ends of said sides terminating at a second position on said central axis spaced from said first position, and outwardly directed opposed feet portions depending from said second position on said central axis including inturned portions depending from said feet portions terminating at a third position on said central axis;
   b. bearing means mounted at each said first, second and third positions on said central axis;
   c. the first section being rigidly secured to each said bearing means forming a generally planar peripheral frame section; and
   d. the second of said two sections being formed of two opposed portions, each formed of the shape of approximately one-half of said first sections, and each one-half portion being pivotally mounted in all said bearing means by axially extending portions, so that each of the opposed portions of said second section pivot from a normal position to said first section to a generally parallel, adjacent position to said first section but on opposed sides thereof.

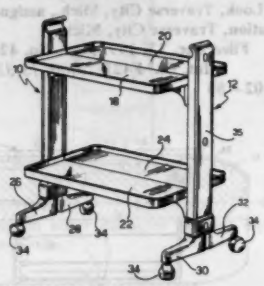
2. A foldable display rack according to claim 1 being further characterized by a removable table top, and means cooperative with said table top and said straight opposed sections in open position for temporarily securing said table top thereon.

4,008,671

TROLLEY WITH FOLDING SHELVES

Giovanni Baldini, Turin, Italy, assignor to Carrar & Matta S.p.A., Turin, Italy

Filed Jan. 20, 1976, Ser. No. 650,646
Claims priority, application Italy, Feb. 7, 1975, 67331/75
Int. Cl.² A47B *3/00*
U.S. Cl. 108—113 7 Claims



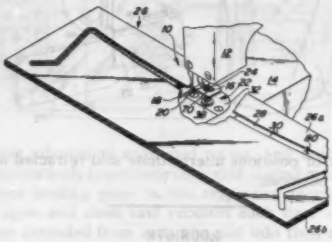
1. A trolley of the type having folding shelves, comprising:
   a. a pair of hollow uprights;
   b. means rigidly interconnecting said hollow uprights;
   c. at least two shelves extending between said two uprights, each of said shelves being constituted by a pair of half-shelves;
   d. pivot means for pivoting each half-shelf of a pair to said uprights, independently of the other half-shelf of the pair, for turning movement about an axis substantially coincident with that edge of the half-shelf adjacent the other half-shelf of the pair between a first position of said half-shelf in which the plane of said half-shelf is substantially perpendicular to the plane defined by said two uprights and a second position in which the plane of said half-shelf is substantially parallel to said plane defined by said two uprights;
   e. two support feet located at the lower end of respective uprights, each of said feet being constituted by a pair of arms;
   f. means for pivotally connecting each arm of a pair of said arms to said uprights, independently of the other arm of the pair, for movement about respective axes substantially parallel to the associated upright between a first position of each said arm in which it extends substantially perpendicular to said plane defined by said two uprights and a second position of each said arm in which it extends substantially parallel to said plane defined by said uprights; and
   g. a connecting mechanism interconnecting all of said half-shelves and said arms on each side of the trolley, said connecting mechanisms being housed in said hollow uprights and operating to transmit movement from any one of said half-shelves on each side of the trolley to said arms on the same side of the trolley, whereby, when any one of said half-shelves is moved from its first position to its second position, said arms are caused by said connecting mechanism to turn from their first to their second positions, and correspondingly, when any one of said half-shelves is moved from its second to its first position, said arms are caused by said connecting mechanism to turn from the second to their first positions.

4,008,672

WORK GUIDING AND TRIMMING APPARATUS FOR SEWING MACHINES

Nicholas Cianciotti, Punxsutawney, Pa., assignor to Queen Casuals, Inc., Philadelphia, Pa.

Filed May 5, 1975, Ser. No. 574,434
Int. Cl.² D05B 21/00; D05C 9/04; D05B 37/00
U.S. Cl. 112—121.12 16 Claims



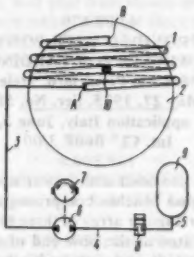
1. For use with a work holder having a guide slot thereon, sewing and trimming apparatus comprising work guiding means affixed to and projecting upwardly with respect to the bed of a sewing machine and adapted to guidingly engage the guide slot of the holder, reciprocating trimming means operatively coupled to said sewing machine and juxtaposed to said work guiding means, a reciprocating needle operatively coupled to the sewing machine and adjacent to said trimming means, said trimming means and said needle being so positioned as to be adapted to extend into and through the guide slot of the holder when said work guiding means is guidingly engaged with the holder, and a cutting edge on said work guiding means, said trimming means cooperating with said cutting edge to trim fabric simultaneously with sewing thereof adjacent to the zone of stitch formation.

4,008,673

BUOYANCY CONTROL SYSTEM FOR SUBMERSIBLE VESSELS

Jury Sergeevich Sverchkov, Bolshevistsky pereulok 13/3, kv. 7; Nadezhda Nikolaevna Balashova, Novoslobodskaya ulitsa, 50/52, kv. 27; Viktor Mikhailovich Popel, ulitsa Karla Marxa, 20 korpus 2, kv. 100, and Viktor Petrovich Shmatok, Amurskaya ulitsa, 76, korpus 3, kv. 10, all of Moscow, U.S.S.R.

Filed Aug. 7, 1975, Ser. No. 602,743
Int. Cl.² B63G 8/00
U.S. Cl. 114—16 E 2 Claims



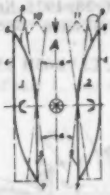
1. A buoyancy control system for submersible vessel, comprising a reservoir filled with a ballast liquid and secured to the hull of a submersible vessel, an outboard pipe fastened to the exterior of said hull and open at one end to the sea water normally surrounding the vessel, the other end of said pipe communicating with said reservoir, a piston movably mounted within said pipe and separating the ballast liquid from sea water entering said pipe, and a pump for transferring said ballast liquid from said reservoir to said pipe and back to said reservoir.

4,008,674

CATAMARAN VESSEL

Leopold Nitzki, and Jurgen Alsen, both of Bremen, Germany, assignors to Aktiengesellschaft "Weser", Bremen, Germany

Filed Feb. 12, 1975, Ser. No. 549,391
Claims priority, application Germany, Feb. 16, 1974, 2407498
Int. Cl.² B63B 1/10
U.S. Cl. 114—61 8 Claims



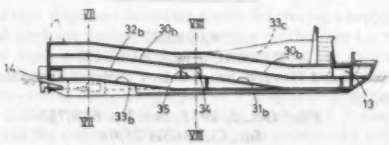
1. An oceangoing catamaran, comprising a pair of spaced-apart hulls each having a longitudinal axis, a forward hull portion and a rearward hull portion, each hull being asymmetrical relative to its longitudinal axis, and the forward portion of each hull being straight at one side and curved at the opposite side in the region of the waterline, the straight sides of the respective forward portions being inclined relative to each other at an angle other than zero and defining an open-ended channel between each other, and the rearward portion of each hull being straight at said opposite side and curved at said one side; and a bridge structure connecting said hulls with one another.

4,008,675

SHIP OF THE TYPE FACILITATING VEHICLE TRANSPORT

Anders Johansson, Bohus-Bjorko, Sweden, assignor to Salen & Wicander Terminalsystem AB, Goteborg, Sweden

Filed Aug. 27, 1975, Ser. No. 608,251
Claims priority, application Sweden, Sept. 2, 1974, 7411064
Int. Cl.² B63B 11/02
U.S. Cl. 114—70 3 Claims



1. A ship of the "Ro-Ro" type having a hull enclosing a cargo carrying portion including two superimposed cargo receiving decks and further having first and second lobbies located forward of, and astern of said cargo carrying portion, respectively, said lobbies being located at about the same level, a ramp at each of said lobbies for providing communication between the ship and a shore based cargo storing area, means for fitting said cargo receiving decks within the hull so one deck will communicate with the forward lobby only and the other deck will communicate with the astern lobby only, bulkhead means for dividing the cargo carrying portion longitudinally at each deck into at least two compartments located side by side, transverse bulkhead means for closing the end of each compartment remote from the pertaining lobby to form

each compartment into a straight, blind alley being supported by a portion of the pertaining deck, and means for supporting said deck portions so they in sidewardly adjacent compartments emanating from the same lobby will be inclined in opposite directions in relation to a horizontal plane, and further so superimposed deck portions emanating from different lobbies will also be inclined in opposite directions.

4,008,676

WATER CRAFT HAVING SEA OPENING WITH CONNECTING CONDUIT

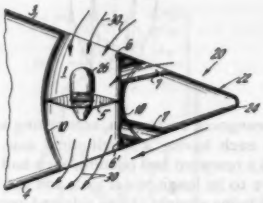
Joachim Emil Brix, Hamburg, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Germany

Division of Ser. No. 529,542, Dec. 4, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,329

Claims priority, application Germany, Dec. 5, 1973, 2360479

Int. Cl.² B63H *25/46*

U.S. Cl. 114—151 **2 Claims**



1. A water craft having a hull with a bow and a stern, a throughgoing curved duct extending completely through said hull adjacent said blow and curved along its length rearwardly toward the stern from each side of said bow and terminating in a duct opening at each side of said hull located below the water line, propulsion means in said duct located centrally between the ends thereof for forcing sea water through said curved duct in a selected direction, and a conduit extending from each side of said hull below the water line directly into said curved duct at respective spaced locations from the curved duct openings and each said conduit having a conduit inlet opening below the water line located forwardly of the corresponding duct opening in a direction towards said bow, said conduits being substantially straight to provide a pressure equalizing flow through said conduits and into said curved duct to reduce turbulent flow in said curved duct adjacent each duct opening and to promote a pressure equalization and smooth flow through said curved duct.

4,008,677

RETRACTIBLE RUDDER

David Hazard Wordell, Sr., R.F.D. 1 (Salem), Oakdale, Conn. 06370

Filed Oct. 2, 1975, Ser. No. 618,750

Int. Cl.² B63H *25/06*

U.S. Cl. 114—162 **10 Claims**

1. In combination with a rudder stock secured against vertical movement and mounted for yaw movement adjacent the stern of a vessel, the improvement comprising:

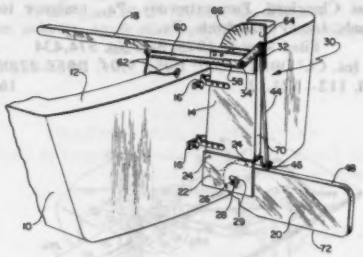
a rudder blade pivotally mounted on a lower portion of said rudder stock;

pivot means mounting said rudder blade for movement about an axis transverse to the plane of said rudder stock for movement between a retracted and an extended position;

operative means mounted on said rudder stock and rigidly connected to said rudder blade for moving said rudder blade between said retracted and extended positions;

first stop means defining said retracted position and second stop means defining said extended position; and

fastening means associated with said pivot means for releasably fixing said rudder blade in any one of an infinite



number of positions intermediate said retracted and extended positions.

4,008,678

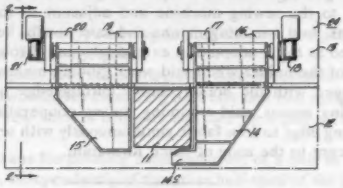
SHIP MOORING SYSTEM

John Lawlor, Sewell, N.J., assignor to Sun Shipbuilding and Dry Dock Co., Chester, Pa.

Filed Oct. 20, 1975, Ser. No. 623,703

Int. Cl.² B63B *21/00*

U.S. Cl. 114—230 **3 Claims**



1. A ship mooring apparatus for roll-on/roll-off ships comprising in combination:

1. a pair of vertical posts spaced apart on a dock,

2. a ship to be docked fitted with two pairs of extendable post-engaging devices, one of said pairs mounted on the bow section of said ship and the second of said pairs mounted on the stern section of said ship, said devices being spaced apart a distance equal to the distance between said posts, and means to separately extend said devices to enable engagement with said posts to prevent horizontal movement, but permit vertical movement of said ship.

4,008,679

MOTORBOAT PROVIDED WITH POWER OPERATED RETRACTABLE WHEELS FOR LANDING ON BEACHES

Stefano Bozzano, 38/8 Via Perniciaro, Mele (Genoa), Italy

Filed May 27, 1975, Ser. No. 580,785

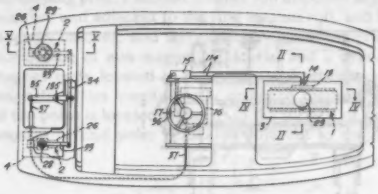
Claims priority, application Italy, June 3, 1974, 12827/74

Int. Cl.² B60F *3/00*

U.S. Cl. 115—1 A **1 Claim**

1. A motorboat provided with power operated retractable wheels for landing on beaches comprising a hull provided on its bottom with a triangular array of three recesses, one of said recesses being located at the bow end of said boat, and the other recesses being aligned with each other at the stern end of said boat, an extendable and retractable landing gear mounted in each recess, an endless track wheel mounted on the landing gear in the bow recess and fixed to rotate in a plane parallel to the keel of said boat, means for driving said track wheel to propel said boat on the ground, first hydraulic means for extending and retracting said landing gear in said bow recess, a wheel mounted on each of the landing gears in

the stern recesses to pivot steerably about a vertical axis, second hydraulic means for extending and retracting said landing gears in said stern recesses, and steering means interconnecting the wheels in said stern recesses for conjoint pivoting, and shutter means pivotally mounted adjacent each recess



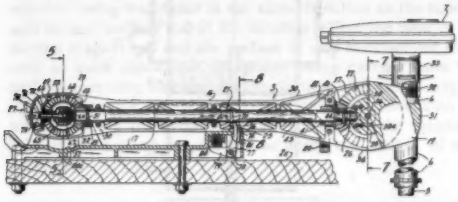
and being adapted to span said recess, and articulated link means operatively interconnecting said shutter means with the associated landing gears in the respective recesses to conjointly open and close said recesses each time said landing gears are extended from and retracted into their recesses.

4,008,680

PIVOTAL MOUNT ASSEMBLY FOR TROLLING MOTORS

Charles F. Alexander, Jr., Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,414
Int. Cl.² B63H *21/26*
U.S. Cl. 115—18 E 11 Claims



1. In an electric trolling motor apparatus having an electric trolling motor for propulsion of a watercraft, a mounting bracket means adapted to be secured to the watercraft and having a pivotally mounted arm means, a gear train means mounted on said arm means and having a control gear means coupled to said mounting bracket means and a driven gear means rigidly connected to the control gear means by a gear and shaft means, a motor support means connected to said driven gear means, said gear train means establishing rotation of the motor support means and said electric trolling motor in response to the pivoting of the arm means between a lowered propulsion position and a raised transport position.

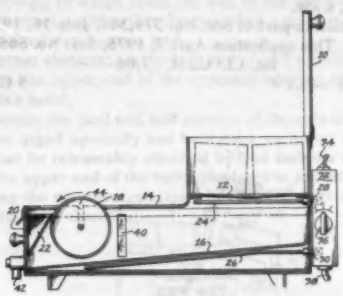
4,008,681

BUTTER DISPENSER

Patrick Steven Johnson, Apt. K-4 1617 Lebanon Road, Nashville, Tenn. 37210

Filed June 19, 1975, Ser. No. 588,281
Int. Cl.² B05C *1/02*, *11/10*
U.S. Cl. 118—5 10 Claims

1. A butter dispenser comprising a three-dimensional L-shaped enclosed frame, the upright arm of said L having an openable top and a heatable grate below said top, the other arm of said L having a basin fitted therein as a drawer, said basin having at least one roller at least partly submerged therein along the other arm of said L and held in position by handles adapted for removing same, said roller being rotatable clockwise and counterclockwise along the direction of protru-



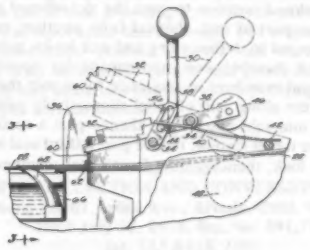
sion of said other arm of said L, and means for heating said basin and said grate.

4,008,682

ARROW PAPER TAPE DISPENSER

Robert T. Meyer, 415 St. Francis Drive, Green Bay, Wis. 54301

Filed Apr. 17, 1975, Ser. No. 568,949
Int. Cl.² B05C *1/06*
U.S. Cl. 118—41 2 Claims



1. In a tape dispenser including means for storing a supply of gummed package sealing tape, a cutting mechanism for cutting said tape, and a moistener for moistening the gummed surface of said tape as it is drawn out of said tape dispenser, the improvement comprising a pair of V-shaped cutting blades in said cutting mechanism for making successive V-shaped cuts across the entire width of said tape to produce an arrow-shaped length of tape, said moistener comprising interrupting means for moistening said gummed surface generally while leaving a dry area at the V-shaped tip so that the tip portion of said gummed surface will not stick to a surface against which it is pressed. Whereby said tape can be subsequently stripped from a carton surface to permit a box to which the tape is glued to be easily opened, said moistener comprising a moistening brush and a source of moisture therefor, and said interrupting means comprising a mask over the central portion of said brush to prevent the central portion of the gummed surface of said tape from becoming moistened, said mask including a V-shaped strip which divides said moistening brush into two spaced apart portions, said V-shaped strip being located between said brush and the gummed surface of said tape in the central portion thereof.

4,008,683

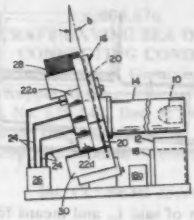
MACHINE FOR TREATING WAFER-FORM ITEMS

Peter H. Rose, Rockport, Mass., assignor to Varian Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 379,346, July 16, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,862

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49.1 **9 Claims**



1. In a machine for treating discrete wafer-form items in a vacuum, the machine including a target station for exposing a succession of said wafer-form items to a treatment beam and a lock system for introducing and removing said items relative to the target station, the improvement wherein said lock system and target station are defined by successive portions of an elongated slot-shaped channel disposed with its axis at an elevation to the horizontal through which said items proceed edgewise while aligned by surfaces of said channel, said channel having an elongated cross-section throughout its length larger in each dimension than the cross-section of said wafer-form items thereby enabling unconstrained edgewise gravity movement of said wafer-form items to successive positions along said channel while providing a small channel volume to be evacuated, a plurality of spaced apart elongated seal members movable between open and closed positions and each sized in said closed position to span the slot-shaped channel for sealing one part of said channel from another, said seal members arranged to define entry and exit locks, said target station located therebetween, and means for opening and closing said seal members in sequence to permit the movement of an item along said channel successively past a first seal member into said entry lock, thence past a second seal member to the target station, thence past a third seal member into said exit lock, thence past a fourth seal member out of said machine.

4,008,684

DEVICE FOR APPLYING A LAYER OF A VISCOUS SUBSTANCE

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

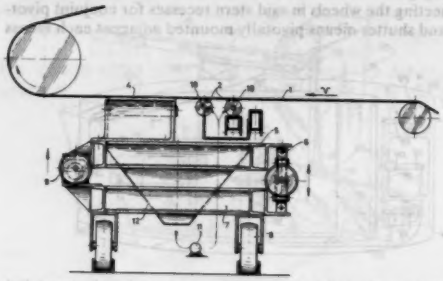
Filed Jan. 12, 1976, Ser. No. 648,286

Claims priority, application Netherlands, Jan. 10, 1975, 7500344

Int. Cl.² B05C *11/04, 3/18*

U.S. Cl. 118—123 **4 Claims**

1. A device for applying a layer of viscous substance to a traveling belt comprising means for applying viscous substance to a surface of a traveling belt, a squeegee blade adjacent said surface of the belt and spaced from said applying means in the direction of travel of said belt to smooth the applied substance to obtain a uniform layer thereof, said blade



having a curved shape across said belt, the curved blade having a convex side directed in the direction of travel of the belt.

4,008,685

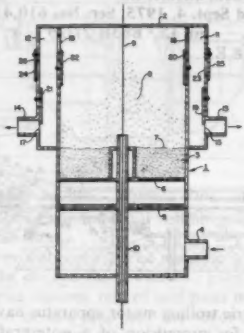
ELECTROSTATIC FLUIDIZED BED BUILD CONTROL

Robert E. Pierce, Abingdon, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1976, Ser. No. 678,579

Int. Cl.² B05B *5/02*

U.S. Cl. 118—629 **5 Claims**



1. In an enclosed electrostatic fluidized bed for coating a vertically moving elongated member by means of a cloud of charged particles, where said electrostatic fluidized bed has two opposing vacuum chambers on its sides for drawing air from the inside of said electrostatic fluidized bed around said cloud for the purpose of controlling the position of said cloud, the improvement comprising venting means leading from each vacuum chamber to the atmosphere, each venting means being provided with adjustable means for controlling the degree of venting.

4,008,686

DEVELOPING DEVICE FOR USE IN ELECTROPHOTOGRAPHY

Hiroshi Katakura, Hachioji, and Keitaro Yamashita, Kamisato, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 16, 1975, Ser. No. 578,266

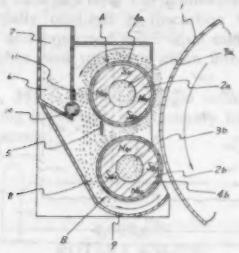
Claims priority, application Japan, May 21, 1974, 49-56864

Int. Cl.² B05B *5/02*

U.S. Cl. 118—651 **7 Claims**

1. A developing device for use in electrophotography wherein a toner is applied to an electrostatical latent image supported on the surface of a member to make the image visible, comprising a rotatable member bearing an electro-

static latent image thereon; a first magnetic roll disposed adjacent to the member which comprises a rotational tube of non-magnetic material and a cylindrical fixed magnet body located in the tube and having more than two magnetic poles spaced from each other wherein one of the poles is located adjacent the surface of said member, said pole serving as a developing pole; a second magnet roll disposed adjacent to the member and adjacent to the first magnet roll, and a developer storing chamber, said second magnet roll comprising a rotational tube of non-magnetic material and a cylindrical fixed magnet body located in the tube and having more than two magnetic poles longitudinally arranged thereon wherein one of the poles is located adjacent to the surface of said member, another of said poles is located adjacent to the first magnet



roll and another of said poles being immersed in said developer storing chamber; the tubes of the first and second magnet rolls being rotated such that the surfaces of said tubes move in the same direction with respect to each other at the point at which said tubes are adjacent to each other, the surface of said member being translated in the same direction as the tube of said second magnet roll at the location where the tube of the second magnet roll and the surface of said member are adjacent to each other, the developer being carried from the developer storing chamber to the portion of the first magnet roll opposite said member, the carrier particles adhered on the member being removed from said surface by the magnetic pole of the second magnet roll adjacent the surface of said member.

4,008,687

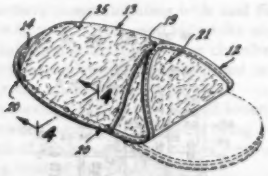
SLEEPING NOOK FOR HOUSE PET

Francis Jackson Keys, 9532 Cortada, El Monte, Calif. 91733

Filed Sept. 17, 1975, Ser. No. 614,134

Int. Cl.² A01K *1/02*

U.S. Cl. 119—1 **4 Claims**



1. A domestic animal shelter generally in the shape of an oversized slipper comprising:

a flexible elongated sole-like base forming a cushion and having a covering of fabric material thereon, said sole-like base having a heel end and a toe end,

a vamp-like hood provided on substantially the toe end half portion of said sole-like base, said vamp-like hood sloping downwardly from an entrance opening on one end thereof toward a vent opening on the toe end thereof,

said vamp-like hood including a wall of fabric material having opposite sides attached adjacent opposite sides respectively on the sole-like base, and a resilient support member provided beneath said wall of fabric material, the bowing of which holds the wall of the vamp-like hood in its erect position thereby providing a nook into which an animal can burrow, and

fastener elements on the heel end of said sole-like base and on the upper end of the entrance opening of the vamp-like hood,

whereby the heel end half portion of the sole-like base can be urged upwardly and bent back such that its heel end can be releaseably attached by said fastener elements to the upper end of the vamp-like hood to provide for covering the entrance opening while leaving vent openings on the sides thereof.

4,008,688

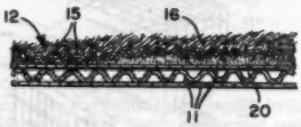
PET BED

Dimitri P. Nicholas, c/o The Orr Felt Company 750 S. Main St., Piqua, Ohio 45356

Filed Dec. 17, 1975, Ser. No. 641,542

Int. Cl.² A01K *29/00*

U.S. Cl. 119—1 **5 Claims**



1. A pet bed having insecticidal properties comprising a relatively impervious bottom sheet-like layer and an upper relatively porous fabric-like covering joined marginally with said bottom layer and being unattached to said bottom layer inwardly of the margins thereof, said covering having a non-woven batting at the upper surface thereof intimately joined to a woven fabric base providing a porosity to permit the passage of powder insecticide therethrough, and a quantity of powdered insecticide received between said covering and said bottom layer so that said powder can penetrate through said covering and come into contact with a pet lying or resting on said upper surface thereof.

4,008,689

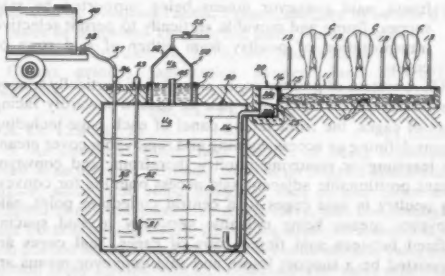
WASTE COLLECTION AND CONVERSION SYSTEM

Teo Albers, 18007 Arline Ave., Artesia, Calif. 90701

Filed July 25, 1975, Ser. No. 591,776

Int. Cl.² A01K *1/00*

U.S. Cl. 119—28 **3 Claims**



1. A waste collection system adapted to collect animal waste for fermentation, comprising:

a trough formed in the ground surface of an animal-retaining enclosure closed at one end and including a vertically adjustable baffle at the other end;

a spring-loaded flapper valve disposed on the distal side of

said baffle closing a cavity arranged below the bottom surface of said trough;

a fermentation tank disposed below said cavity;

transfer means connecting said tank to said cavity;

gas-accumulating means disposed above said tank for collecting the ullage gases therefrom; and

said accumulating means includes a liquid-filled ring disposed on the upper surface of said tank, an inverted dome having the opening thereof immersed in said liquid-filled ring and a vent connecting the ullage in said tank with the ullage in said dome.

4,008,690

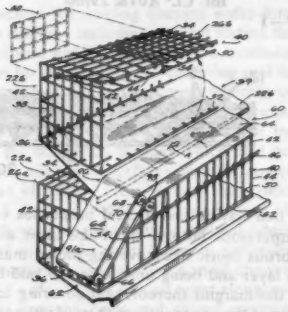
POULTRY CAGE SYSTEM WITH POULTRY REMOVAL

Robert L. van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 504,968

Int. Cl.² A01K *29/00*

U.S. Cl. 119—82 **19 Claims**



1. A poultry cage system comprising, in combination:

a plurality of poultry cages arranged in a row, each of said cages having means defining an access opening through which poultry confined therein can be removed, said cages including cover means movable selectively between a first position relative said opening wherein said cover means covers said opening to prevent movement of poultry therethrough and a second position wherein said cover means is removed from said opening to permit access therethrough, and a conveyor means fixably positionable along and extending the length of said row adjacent said openings for conveying poultry urged out of said cages through said openings wherein at least two tiers of cages are arranged in rows spaced vertically by a support frame, said conveyor means being supported by said support frame and movable vertically to permit selective transportation of poultry from either of said rows of cages.

15. A system of poultry cages arranged in vertically spaced tiers, each tier comprising a pair of spaced inwardly facing rows of cages, tne front facing panel of each cage including means defining an access opening and removable cover means for inserting or removing poultry therefrom, and conveyor means positionable adjacent said access opening for conveying poultry in said cages to a central collection point, said conveyor means being movable vertically in said spacing defined between said tiered rows of cages, said cages are supported be a support frame and said conveyor means are suspended by a sub-frame movable vertically relative said support frame, said conveyor means is an endless driven belt extending the length of said tiers, said sub-frame comprising a plurality of spaced yokes suspended by a pulley cable means whereby said conveyor means is raised or lowered by said pulley cable means to a desired level, and wherein said yoke includes a catch means associated therewith and operable with a stop on said support frame to prevent accidental lowering of said conveyor means.

4,008,691

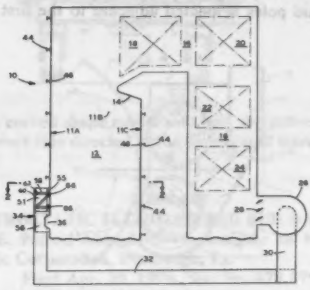
SUPPORT SYSTEM

Edward Wells Kreider, Wadsworth, and Thomas Paul Hoosic, Clinton, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,858

Int. Cl.² F22B *37/36, 37/24*

U.S. Cl. 122—494 **4 Claims**



1. In a fluid heating unit having upright walls defining a chamber therebetween for the flow of heating gases, structural members disposed outside the chamber and connected to said walls for lateral support and reinforcement thereof, at least one plenum extending along the width of one of the walls and communicating with said chamber, the plenum being attached to said wall, ducts supplying heated gases to opposite ends of the plenum, said ducts being connected to fixed supports and including end sections extending from the supports for connection to said plenum ends, plate means abutting the plenum ends and being rigidly connected to adjoining structural members to transmit end section and plenum thermal expansion stresses thereto.

4,008,692

VEHICLE-MOUNTED GASEOUS FUEL GENERATOR

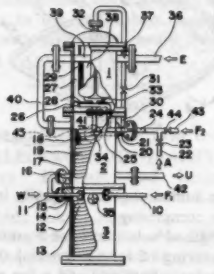
Hiroshi Shinohara, Okazaki; Kunihiko Masunaga, Toyota; Shigeo Murakami, Okazaki, and Kazuhiko Ishiguro, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 4, 1974, Ser. No. 520,936

Claims priority, application Japan, Nov. 6, 1973, 48-124680

Int. Cl.² F02B *43/00*

U.S. Cl. 123—3 **4 Claims**



1. A gaseous fuel generator for mounting on a vehicle provided with a supply of liquid hydrocarbon, a supply of water and an internal combustion engine equipped with a carburetor and discharging an exhaust gas, said generator comprising

a primary heat exchanger (3) holding separate coiled pipes (12, 13) for separately receiving and heating liquid hydrocarbon and water provided by said supplies,

a secondary heat-exchanger (2) holding separate coiled pipes connected to the coiled pipes (12, 13) of said primary heat exchanger to receive hydrocarbon and water respectively therefrom, means for conducting the exhaust gas from said engine to said secondary heat exchanger (2) to heat and vaporize said hydrocarbon and water,

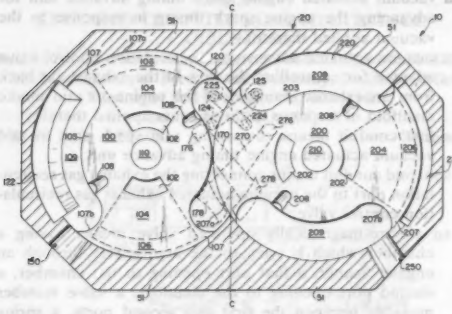
a reaction-reforming chamber (1) comprising an outer partial oxidation chamber (27) containing an outer catalyzer layer connected to receive hydrocarbon vaporized in said secondary heating chamber and air and partially oxidize said vaporized hydrocarbon, and an inner steam-reforming catalyzer layer (29) connected to receive both said partially oxidized hydrocarbon from said outer chamber and vaporized water from said secondary heating chamber, and transform them into an inflammable gas, and

means (34, 35) for collecting said inflammable gas and transmitting it through said primary heat exchanger to said carburetor.

4,008,693
ROTARY ENGINE

Everett Dale Rea, and Terry Gene Rea, both of 1928 Cardinal Drive, Sioux Falls, S. Dak. 57105

Filed Aug. 26, 1975, Ser. No. 607,996
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.25 **7 Claims**



1. A rotary combustion engine comprising

an engine block,

said engine block having therein at least first and second adjoining rotor chambers and first and second peripheral holding chambers communicating with said first and second rotor chambers, respectively, and air intake means communicating with said first and second rotor chambers,

at least first and second rotors disposed in said first and second rotor chambers, respectively,

said rotors having at least two spaced lobes defining voids therebetween, said rotor chambers being configured such that each of the lobes of said rotors meshes with a corresponding void of the other rotor,

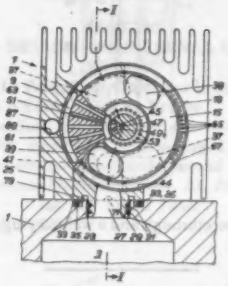
each of said lobes having an air intake passageway therethrough, the air intake passageways of said first rotor communicating with said first holding chamber when at least a portion of said air intake passageways is in relative alignment with at least a portion of said first holding chamber, and the air intake passageways of said second rotor communicating with said second holding chamber when at least a portion of said air intake passageways is in relative alignment with at least a portion of said second holding chamber,

said air intake passageways constituting means for providing a supercharging effect when said rotors are rotated.

4,008,694
ROTARY CYCLING VALVE FOR INTERNAL COMBUSTION ENGINES

Walter Monn, Via Codeborgo 16, 6500 Bellinzona, Switzerland

Filed Jan. 22, 1975, Ser. No. 543,141
Claims priority, application Switzerland, Jan. 30, 1974, 1231/74; Germany, Nov. 14, 1974, 2454006
Int. Cl.² F01P *1/08*
U.S. Cl. 123—41.4 **20 Claims**



1. A rotary cycling valve for internal combustion engines, comprising a valve housing having suction and exhaust ports; a circular rotary valve body within said housing having internal passages adapted to selectively connect said suction and exhaust ports with the working space of an engine cylinder; and a cooling system operatively associated with said housing and valve body and connected with an engine related source of subatmospheric pressure; said cooling system comprising cooling chambers within said valve body and cooling medium circulating channels leading from radially inner to radially outer portions of said valve body, said internal passages of said valve body providing inlet and outlet openings, respectively, on its periphery and outlet and inlet openings, respectively on one and the other of its side faces, and wherein a drive shaft of said valve body has an axial cooling air conducting bore in communication with radial cooling air admitting bores thereof.

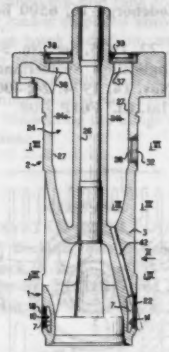
4,008,695
COOLED INTEGRAL VALVE CHEST FOR AN INTERNAL COMBUSTION ENGINE AND METHOD FOR MAKING SAME

Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Jan. 13, 1975, Ser. No. 540,502
Claims priority, application France, Jan. 29, 1974, 74.02900
Int. Cl.² F01P *3/12*
U.S. Cl. 123—41.76 **11 Claims**

5. An overhead valve chest capable of being removably fitted as an insert in a cylinder head of an internal combustion engine, said chest being integrally cast in one piece and adapted to accommodate one single valve, and comprising: a cage portion having several depending arms; an annular valve seat portion interconnecting said arms endwise, said valve seat portion being formed with an endless annular valve seat cooling chamber surrounding the center line axis of said valve chest; and a valve stem guide portion formed with and surrounded by an annular cooling chamber; at least one duct formed in at least one of said arms and extending between said valve seat cooling chamber and said valve stem guide cooling chamber, said duct opening into said chambers with its opposite ends, respectively, to provide a permanent communica-

tion between said chambers; the radially outer wall of at least one of said cooling chamber being formed with at least one



hole extending therethrough and a welded plug closing off said hole.

4,008,696

CARBURETOR FOR OPTIMUM CONTROL OF AN AIR-FUEL MIXTURE SUPPLY TO THE ENGINE DURING DECELERATION

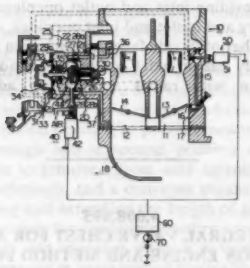
Takashi Hisatomi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 13, 1975, Ser. No. 557,946

Claims priority, application Japan, Mar. 19, 1974, 49-31143

Int. Cl.² F02D *31/00*

U.S. Cl. 123—97 B **5 Claims**



1. An improved carburetor with a slow fuel supply system for use with an internal combustion engine having an intake manifold, the carburetor comprising electric control means connected with a source of electric power and sensitive to the condition of the engine acting as a brake at an engine speed above a predetermined value and producing an electric signal indicating said condition, a solenoid-operated valve disposed in the slow fuel supply system and operatively connected with the control means to block the supply of fuel upon receiving said electric signal, a by-pass mixture supply passageway communicating between a source of mixture supply and the intake manifold for supplying the intake manifold with additional mixture, a diaphragm-operated valve assembly disposed in said passageway and operable by the intake manifold vacuum to open and close said passageway, and solenoid-operated means for actuating the diaphragm-operated valve assembly, said solenoid-operated means being operatively connected with said control means for feeding, upon receiving said electric signal, the diaphragm-operated valve assembly with the air cancelling the manifold vacuum causing said valve to close the passageway.

4,008,697

INTERNAL COMBUSTION ENGINE

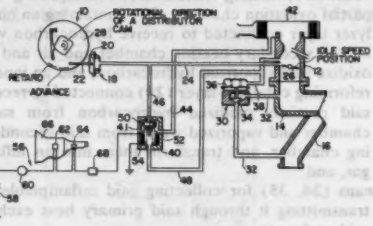
Mitsutaka Konno, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 13, 1975, Ser. No. 577,025

Claims priority, application Japan, July 19, 1974, 49-85910[U]

Int. Cl.² F02P *5/04;* **F02M** *25/06*

U.S. Cl. 123—117 A **2 Claims**



1. An engine spark timing and exhaust gas recirculation control comprising, in combination:

a carburetor induction passage having a throttle valve rotatably mounted therein and adapted to be connected to an intake manifold of the engine, a spark port in the induction passage located above an idle speed position of said throttle valve and an exhaust gas recirculation port located in the induction passage above and axially spaced from said spark port;

a vacuum actuated engine spark timing advance unit for advancing the engine spark timing in response to the vacuum applied thereto;

a vacuum actuated exhaust gas recirculation control valve adapted for controlling the flow of the exhaust gas back from an exhaust manifold of the engine to said intake manifold in response to the vacuum applied thereto;

a first conduit means connecting said spark port to said vacuum actuated engine timing advance unit;

a second conduit means connecting the exhaust gas recirculation port to the vacuum actuated exhaust gas recirculation control valve;

an electro-magnetically operated valve means having a chamber which is open to the atmosphere through an engine cleaner, a first port opening to the chamber, a second port opening to the chamber, a valve member movable between the first and second ports, a spring means biasing said valve member toward the first port to close the same, and a solenoid means uring the valve member toward the second port, when energized, to close the same;

a first branch conduit means connecting the first conduit means to the first port;

a second branch conduit means connecting the second conduit means to the second port; and

means for energizing the solenoid means during a predetermined engine operating condition.

4,008,698

HIGH ENERGY ADAPTIVE IGNITION SYSTEM

Todd Henry Gartner, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

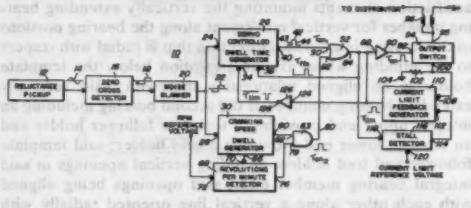
Filed Aug. 28, 1975, Ser. No. 608,435

Int. Cl.² F02P *1/00*

U.S. Cl. 123—117 R **8 Claims**

1. An ignition system for an internal combustion engine comprising an ignition coil having primary and secondary windings, the secondary winding providing a high voltage spark suitable for engine firing, the primary winding series connected between a bias supply and an electronic switch, the switch operable to conductively couple or nonconductively

decouple the primary to a reference terminal dependent on signals at a switch control terminal, a sensor operably coupled to the engine producing a periodic output voltage in synchronism to the engine cycle, a controlled pulse generator, having first and second inputs, synchronized to the sensor signal and coupling to the control terminal of the electronic switch, the generator providing a pulse having a leading edge suitable for activating the switch to a conductive state and a trailing edge suitable for activating the switch to a nonconductive state, the trailing edge synchronized to occur at a predetermined engine



position, the leading edge predeterminedly controlled by either of said two pulse generator inputs, the first generator input being a current limit generator input which couples to means for generating a first control signal representative of the time during each engine cycle that the coil primary carries a minimum predetermined current, and the second generator input being a coil off time generator input which couples to a means for generating a second control signal representative of the time during each engine cycle that the switch and coil are in a nonconductive state.

4,008,699

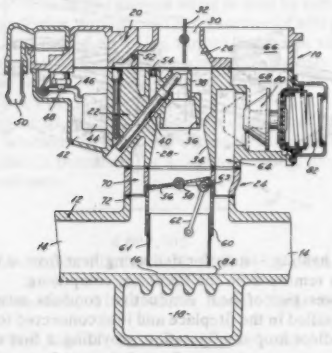
EXTENDED THROTTLE BORE MULTI-STAGE CARBURETOR

Paul E. Braun, and Melvin F. Sterner, both of Bloomfield Hills, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 5, 1976, Ser. No. 674,010

Int. Cl.² F02M *31/08*

U.S. Cl. 123—122 AB **7 Claims**



1. In combination, a dual stage carburetor having primary stage and secondary stage induction passages each having an air inlet at its upper end and a discharge opening at the other lower end, an engine intake manifold extending essentially at right angles to the axis of the passages and having an engine exhaust gas heated floor portion directly beneath and aligned with the lower discharge ends of the primary and secondary induction passages for the splash of fuel against the floor portion to warm the fuel and aid in the vaporization thereof, the primary induction passage having a fuel metering venturi receiving fuel therein for induction of fuel into the manifold, the primary passage discharge end extending into the intake manifold into close proximity to the floor portion but spaced therefrom so as to vaporize the fuel mixture discharged thereagainst while permitting a controlled flow of mixture out of the space between the primary passage and floor portion towards the engine cylinders, the discharge end of the secondary induction passage being concentric with and surrounding a lower portion of the primary passage and terminating adjacent the inlet to the intake manifold so as to discharge air into the manifold in a manner bypassing the flow restriction caused by the extension of the primary passage into close proximity to the floor portion, and control means controlling flow of air through the secondary passage.

4,008,700

FUEL FEED DEVICE FOR INTERNAL COMBUSTION ENGINE

Michel Pieriot, Le Pecq, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., France

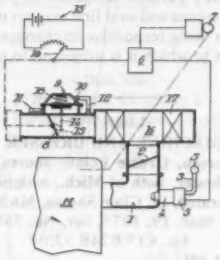
Filed June 17, 1974, Ser. No. 480,251

Claims priority, application France, Aug. 1, 1973, 73.28200

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AW **5 Claims**



1. A fuel feed apparatus for internal combustion engines, comprising: an intake pipe; a main throttle member located in said intake pipe; an auxiliary throttle member located in said intake pipe upstream of said main throttle member; means for progressively opening said auxiliary throttle member proportionally as the flow rate of air in said intake pipe increases; a source of fuel under pressure; a fuel supply circuit coupled to said fuel source and said intake pipe and opening into said pipe downstream of said main throttle member, said supply circuit including at least one solenoid valve for controlling the supply of fuel from said source into said pipe; a metering system coupled to said solenoid valve and to said auxiliary throttle member for providing energizing signals to said solenoid valve, the duration of said signals in a given time period varying proportionally with the amount of opening of said auxiliary throttle member; a chamber located in said intake pipe downstream of said auxiliary throttle member and upstream of said main throttle member; and an air filter located in said chamber wherein air flowing through said chamber circulates across said filter.

4,008,701

MAGNETIC CIRCUIT APPARATUS FOR AN ELECTRONIC IGNITION SYSTEM OF A COMBUSTION ENGINE

Hugh C. Webber, Detroit, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

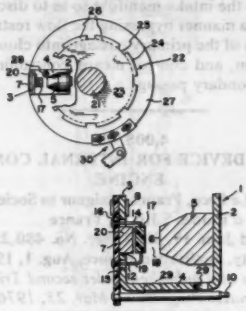
Filed Dec. 31, 1975, Ser. No. 645,801

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **15 Claims**

1. Magnetic circuit apparatus for an electronic ignition system of a combustion engine comprising magnetically permeable frame means; first magnet means carried by said frame

means for establishing with the latter a magnetic flux path; second magnet means carried by said frame means in confronting relation with but spaced from said first magnet means; and pulse generating means interposed between said first and second magnet means in said flux path and spaced



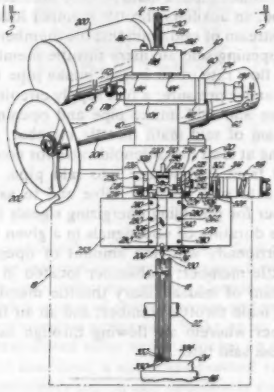
from said first magnet means by a gap of sufficient width to enable magnetically permeable means to pass between said pulse generating means and said first magnet means, said pulse generating means being responsive to changes in the density of the magnetic flux to which it is subjected to generate an electrical pulse.

4,008,702

GRINDING MACHINE AND DRESSER THEREFOR

Marvin R. Anderson, Grosse Pointe Shores, and Harald N. Jungesjo, Rochester, both of Mich., assignors to Anderson-Cook, Incorporated, St. Clair Shores, Mich.

Filed Mar. 19, 1975, Ser. No. 559,945
Int. Cl.² B24B *53/08*
U.S. Cl. 125—11 PH **6 Claims**



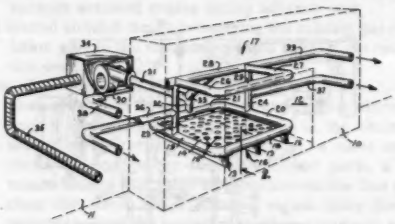
1. A dresser for use with a grinding machine including a grinding wheel rotatable about a horizontal axis and having a toothed profile for grinding a toothed configuration in a workpiece, the dresser comprising: a support plate mounted above the grinding wheel; a template holder; a horizontal slideway mounting the template holder on the support plate so as to support a template with the toothed configuration of the grinding wheel profile in an upwardly facing direction that is oriented radially with respect to the grinding wheel; means for adjusting the horizontal position of the template holder along the slideway; a first linear antifriction bearing extending horizontally and including a central bearing member fixed to the support plate, a pair of vertically spaced bearing members positioned above and below the central bearing member, and anti-friction elements supporting the vertically spaced bearing members on the central bearing member; a second linear antifriction bearing extending vertically and including a vertically extending bearing housing of a hollow rectangular cross-section defining horizontally spaced bearing portions that oppose each other, a vertically extending bearing member received within the vertically extending bearing housing, and antifriction elements mounting the vertically extending bearing member for vertical movement along the bearing portions of the housing in a vertical direction that is radial with respect to the grinding wheel axis at a location below the template holder in an aligned relationship therewith; said vertically extending bearing member of the second bearing including an integral upper end providing a template follower holder and an integral lower end providing a tool holder; said template follower and tool holders including vertical openings in said integral bearing member ends; said openings being aligned with each other along a vertical line oriented radially with respect to the grinding wheel axis; and a hydraulic actuator mounted on the support plate and connected to the vertically spaced bearing members of the horizontally extending first antifriction bearing so as to move the vertically extending second antifriction bearing horizontally such that a template follower and tool supported by the holders thereof respectively engage a mounted template on the template holder and the toothed profile of the grinding wheel to dress the grinding wheel in a precise manner.

4,008,703

FIREPLACE HEATING SYSTEM

Tommy L. Allgood, 2035 Arizona, Joplin, Mo. 64801

Filed Apr. 17, 1975, Ser. No. 569,005
Int. Cl.² F24H *3/08*
U.S. Cl. 126—121 **8 Claims**



7. A heating system for delivering heat from a fireplace to an area remote from the fireplace, comprising:

a lower tier of heat conductive conduits adapted to be installed in the fireplace and interconnected to present an endless loop configuration providing a first closed path for accommodating a flow of air, said first path having an inlet and and outlet;

an upper tier of heat conductive conduits interconnected to present an endless loop configuration providing a second closed path for accommodating a flow of air, said second path having an inlet and and outlet;

means supporting said upper tier of conduits at an elevated position above said first tier;

fan means located exteriorly of the fireplace in communication with the inlets to said first and second paths, said fan means operable to force air into each path for circulation therein; and

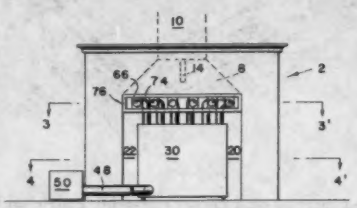
air distributing means extending from the outlets of said first and second paths to said remote area to deliver heated air thereto.

4,008,704

UNIVERSALLY ADJUSTABLE FORCED AIR FIREPLACE HEATER

Henry W. Petrie, 5212 Pommeroy Drive, Fairfax, Va. 22030

Filed June 10, 1975, Ser. No. 585,656
Int. Cl.² F24B 7/02
U.S. Cl. 126—121 **12 Claims**



1. A heat exchanger for placement in the firebox of an existing fireplace and increasing the heat output thereof, comprising:

a substantially vertical plenum located in the rear portion of said firebox, with a front surface approximately as wide as said firebox, a top surface having a plurality of forced air egress ports, and a forced air ingress port in the lower portion thereof;

a forced air blower connected to said ingress port for driving ambient air into said plenum;

a plurality of heat exchanger tubes, each tube having a first end connected to one of said plurality of egress ports and extending forwardly from said plenum across the throat of said fireplace with the second end thereof directing said forced air out of said tube and past the lintel of said fireplace and into the ambient;

each said heat exchanger tube further comprising:

a pivotal mounting of each said tubes on respective ones of said egress ports of said plenum, providing for angular motion of said tube about a substantially vertical axis;

said forced air in said plenum being heated by conduction and radiation through said front surface of said plenum and said forced air being further heated in said heat exchanger tubes from the combustion gases in the throat of said fireplace, so as to enhance the heating efficiency of the fireplace;

whereby said forced air may be directed out of said tube in a selected direction and access to the throat of the fireplace is permitted for adjustment of the damper or maintenance.

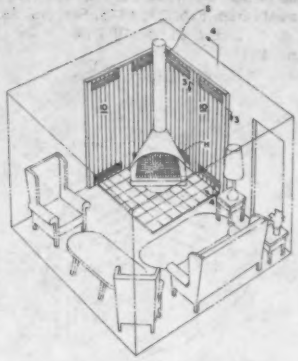
4,008,705

FREESTANDING-FIREPLACE AND STOVE HEAT SHIELD

James H. Robertson, 11811 Cedar Lane, Kingsville, Md. 21087

Filed June 17, 1975, Ser. No. 587,650
Int. Cl.² F24B 7/00
U.S. Cl. 126—121 **11 Claims**

1. A stove and fireplace shield for installation over a building structure vertical wall or the like in spaced relation with a freestanding stove or fireplace or the like comprising: a face panel having an intake aperture therein at the bottom and an exit aperture therein spaced downward from the top, a plurality of metallic core panels, covered by the face panel means for holding the face panel in proximate parallel-spaced relation to a said vertical wall with the plurality of core panels in proximate generally parallel-spaced relation therebetween forming a panel assembly with a plurality of vertical air passages layered over said wall and leading from proximate the intake aperture to the exit aperture: means for closing the ends of said panel assembly, a top cap for closing the top of said panel assembly, all said plurality of core panels being laterally corrugated, the corrugations in all said core panel substantially corresponding in lateral location, and the intake



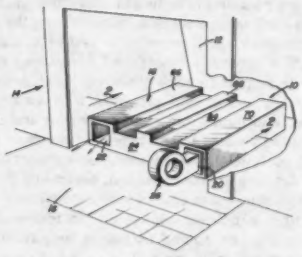
aperture and the exit aperture respectively having a plurality of louvres, each louvre being angled substantially in alignment with a respective vertical air passage.

4,008,706

FIREPLACE FURNACE

John M. Buanno, Paradise Point Road, Mayfield, N.Y. 12117

Filed June 27, 1975, Ser. No. 590,861
Int. Cl.² F24B 7/02
U.S. Cl. 126—121 **9 Claims**



1. A fireplace furnace, comprising, in combination:

a. a housing having a wall provided with an inlet and outlet, the inlet and outlet spaced from one another on the wall common to the inlet and outlet; and

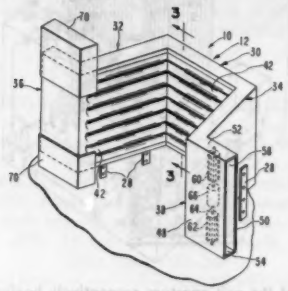
b. baffle means arranged within the housing for deflecting air flowing from the inlet to the outlet along a tortuous path within the housing, the baffle means including a pair of spaced, substantially parallel plates disposed extending into the housing from adjacent the inlet and outlet, the plates being spaced from one another and disposed between, the inlet and outlet, the the housing walls including a top wall and a bottom area perpendicular to the wall common to the inlet and outlet with the plates extending from the bottom area to the top wall of the housing, and the baffle means further including a plurality of separate arcuate members disposed extending between the top wall and the bottom area of the housing, two of the arcuate members being arranged opposite of and opening concavely toward respective ones of the inlet and outlet of the housing, and another of the arcuate members being arranged between the plates of the baffle means, and between at least one of the arcuate members, and arranged opening concavely toward the plane of the two of the arcuate members.

4,008,707

REMOVABLE FIREPLACE HEATER

Robert N. Bartlett, 77 Walnut Ave., Atherton, Calif. 94025

Continuation of Ser. No. 432,020, Jan. 9, 1974, abandoned.
This application Feb. 27, 1975, Ser. No. 553,770
Int. Cl.² F24B 7/00
U.S. Cl. 126—131 **2 Claims**



1. A portable air heater for heating air with heat generated in a fireplace comprising: a hollow body having a first section and a pair of second sections rigidly and airtightly secured to respective ends of the first section, each section having a fluid passage therethrough, the second sections being in fluid communication with ends of the first section and extending laterally therefrom, the sections being constructed of a heat conductive material and defining outer surfaces for placement adjacent walls of the fireplace and inner surfaces for partially surrounding a fire in the fireplace, the height of the fluid passages of the sections being sufficient to extend throughout at least a major portion of the height of the fireplace, a hollow extension for each second section, respectively, the extensions being rigidly and airtightly secured to and extending laterally from respective second sections and projecting in opposite directions with respect to each other, each extension having a fluid passage and outer end provided with an opening, the height of the fluid passage of each extension and its opening being substantially equal to the height of the fluid passage of the adjacent section, the extensions, second sections and the first section defining an unobstructed, horizontal fluid passage extending from the outer end of one extension to the outer end of the other extension, elongated fan means disposed in one extension adjacent to and extending longitudinally of the opening thereof for inducing a flow of air through said one extension and the interior of the body to the opening in the other extension so that air in said flow is heated and the heated air is directed into the space adjacent to the fireplace.

4,008,708

SOLAR ENERGY COLLECTOR

Robert W. Hagarty, Cambridge, Canada, assignor to Dow Corning Corporation, Midland, Mich.

Filed Sept. 29, 1975, Ser. No. 617,553
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 **4 Claims**

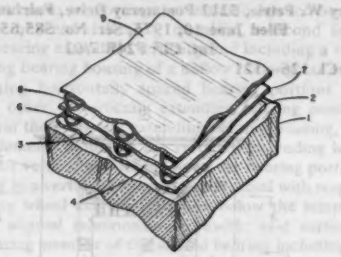
1. A solar energy collector comprising a first sheet of flexible material,

a plurality of extruded flexible spacer members adhered to the bottom of said first sheet in substantially parallel spaced relationship, and

a second sheet of flexible material adhered to the bottoms of said spacer members,

whereby said spacer members and said sheets define a plurality of parallel fluid paths for passage of heat absorbing fluid therethrough to transmit heat from said collector;

and further comprising a second plurality of extruded flexible spacer members adhered to the top of said first sheet in substantially parallel spaced relationship, and



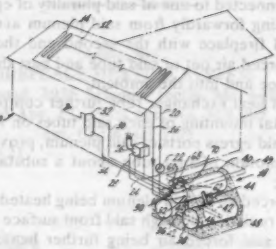
a third sheet of solar energy transmitting material adhered to the tops of said second plurality of spacer members.

4,008,709

UNDERGROUND STORAGE SYSTEM FOR HEATING AND COOLING SYSTEMS

Douglas M. Jardine, 4705 Brady Place, Colorado Springs, Colo. 80915

Filed Mar. 17, 1975, Ser. No. 558,672
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **18 Claims**



5. A system for the storage and retrieval of thermal energy derived from an external source, said system comprising:

a metal storage container disposed below the surface of the earth;

a heat transfer tank disposed below the surface of the earth and spaced vertically from said storage container;

a passageway interconnecting said storage container and said heat transfer tank;

a heat transfer fluid in said container and said tank, and freely circulating therebetween through said passageway;

heat exchange means in said tank and coupled with the external source of thermal energy, said heat exchange means functioning to exchange thermal energy with said heat exchange fluid in said tank; and

an envelope of tightly packed, non-coherent, particulate material surrounding said container, said particulate material being substantially chemically and electrolytically inert with respect to said container and having a coefficient of thermal conductivity at least as great as that of the surrounding earth to enhance the transfer of thermal energy between said container and the surrounding earth.

14. A thermal energy storage and retrieval system intended primarily for use in connection with a solar heater, said system comprising:

a thermal energy storage container;

a pair of heat exchange tanks, said tanks and said container being disposed below the surface of the earth in spaced apart relationship with said tanks being disposed in gener-

ally the same horizontal plane and vertically spaced from the horizontal plane of said container;

at least one laterally extending conduit interconnecting said tanks for fluid communication therebetween and a vertically extending conduit communicating between said laterally extending conduit and said container;

at least one riser extending between each of said tanks and said container for fluid communication therebetween;

a heat exchange coil disposed in each of said tanks and coupled with a solar heat exchanger for the transfer of thermal energy between said solar heat exchanger and said heat exchange coils;

a heat exchange medium contained in each of said tanks and said container for receiving thermal energy from said solar heater and for storing said thermal energy in said container, said medium freely circulating through said conduits and said risers, and between said tanks and said container in response to temperature differentials in said tanks and said container;

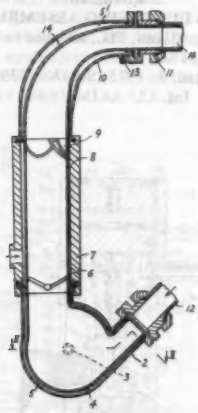
an envelope of tightly packed, non-coherent material surrounding said tanks and said container to effect a corrosion-resistant barrier therebetween and to aid in the transfer of thermal energy between at least said container and the surrounding earth, thereby to utilize the surrounding earth for the storage and retrieval of thermal energy.

4,008,710

BLOOD PUMP

Horst Chmiel, No. 15, Brunnstrasse, 51 Aachen-Laurensberg, Germany

Filed Jan. 28, 1975, Ser. No. 545,000
Int. Cl.² A61M *1/03*
U.S. Cl. 128—1 D 9 Claims



1. A blood pump comprising:

a. rigid outer wall means defining a squeeze pump being operated by a pumping medium and having a flexible pumping tube, an entry side and an exit side, entry side connection means and exit side connection means, and

b. valve means for controlling the flow of blood through said pump,

c. said entry side connection means including an atrium and a diaphragm means,

d. said atrium being defined by said outer wall means and said diaphragm means forming an internal lining within the atrium,

e. said lining diaphragm being separated from the rigid outer wall means by said pumping medium,

f. said atrium is substantially circular in cross-section, and

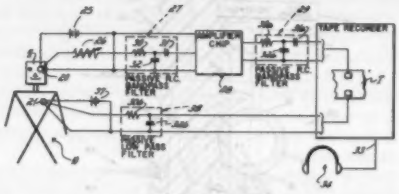
g. said entry side connection means includes means for directing the flow of blood tangentially into said atrium.

4,008,711

METHOD AND APPARATUS FOR NON-INVASIVE DETECTION OF INTRACRANIAL ANEURYSMS

Charles P. Olinger, and Jacob F. Wasserman, both of Cincinnati, Ohio, assignors to Charles P. Olinger, Cincinnati, Ohio

Filed June 30, 1975, Ser. No. 591,332
Int. Cl.² A61B *7/04*
U.S. Cl. 128—2 K 26 Claims



1. A method for the non-invasive detection of the probable existence of intracranial aneurysms in humans comprising the steps of:

monitoring sound waves emanating from an external predetermined area of the head,

converting the monitored sound waves into an electrical signal, and

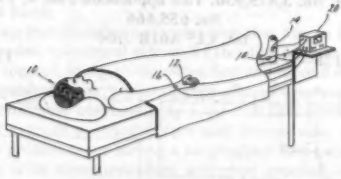
analyzing the electrical signal to determine the existence of a sound having a constant frequency within the approximate range of 200 Hz. to 800 Hz., said constant frequency sound being indicative of the probable existence of an aneurysm.

4,008,712

METHOD FOR MONITORING BODY CHARACTERISTICS

Jan Nyboer, Grosse Pointe, Mich., assignor to J. M. Richards Laboratories, Grosse Pointe Park, Mich.

Filed Nov. 14, 1975, Ser. No. 632,038
Int. Cl.² A61B *5/05*
U.S. Cl. 128—2.1 Z 13 Claims

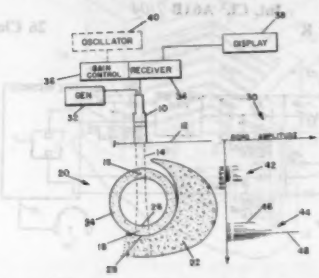


1. In a method of dialysis of a patient in which there is an established selected electrical characteristic having a normal magnitude indicative of a normal body fluid condition and which electrical characteristic changes in response to dialysis, the steps comprising: attaching a first pair of electrodes to the patient, attaching a second pair of electrodes to the patient, supplying an electrical signal to said first pair of electrodes, operating on said electrical signal via said second pair of electrodes to provide an indication of the measured magnitude of the selected electrical characteristic of the patient, performing dialysis on the patient, monitoring the change in magnitude of the selected electrical characteristic as a result of dialysis on the patient and comparing the change in magnitude of the selected electrical characteristic as measured on the patient with said normal magnitude whereby an indication of the effectiveness of the dialysis can be determined.

4,008,713
ULTRASONIC DIAGNOSTIC TECHNIQUE UTILIZING SWITCHED GAIN SIGNAL PROCESSING

James M. Griffith, and Walter L. Henry, both of Bethesda, Md., assignors to The United States of America, Washington, D.C.

Filed Sept. 18, 1975, Ser. No. 614,668
Int. Cl.² A61B 10/00
U.S. Cl. 128—2.05 Z 8 Claims

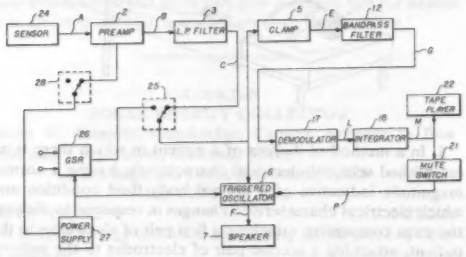


1. A technique for measuring the wall thickness of a cardiac structure, which comprises the steps of: transmitting an ultrasonic signal towards the wall of the cardiac structure of interest; receiving ultrasonic echo signals reflected from said wall by means of a gain-variable receiver; switching the gain of said receiver repeatedly from a first value to a second value; and recording the output from said receiver.

4,008,714
BRAIN WAVE CORRELATION SYSTEM AND METHOD OF DELIVERING A RECORDED PROGRAM OF MATERIAL EDUCATIONAL IN CONTENT

Jose R. Silva, and John M. Narrace, both of P.O. Box 1149, Laredo, Tex. 78040

Continuation of Ser. No. 490,262, July 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 334,743, Feb. 22, 1973, Pat. No. 3,875,930. This application Feb. 4, 1976, Ser. No. 655,666
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.1 B 11 Claims



1. A method of presenting educational material to a human subject comprising:
monitoring the level of concentration of the human subject,
determining that said subject has attained a preselected level of enhanced capacity for concentration,
suppressing said determining step once said preselected level has been attained and coincident therewith,
presenting a preselected program of educational material to said subject.

4,008,715
MASSAGING AND RELAXING DEVICE

Brunhilde Brodbeck, 1440 Poplar Ave., Memphis, Tenn. 38104

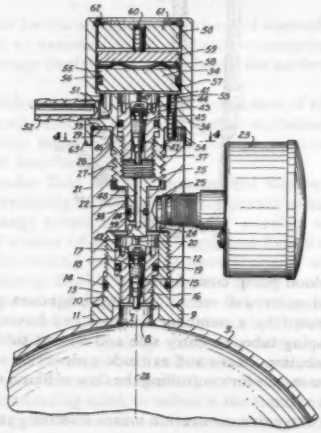
Division of Ser. No. 511,981, Oct. 4, 1974, Pat. No. 3,934,579.
This application Dec. 2, 1975, Ser. No. 637,021
Int. Cl.² A61H 15/00
U.S. Cl. 128—57 4 Claims

1. A massaging and relaxing device for stimulating and relaxing various parts of the body comprising
a pair of spaced coaxial hand grips,
a disk on the inside of each hand grip,
means mounting said disks for free rotation with respect to said hand grips about a common axis,
a plurality of rows of beads extending between said disks, each row being closely adjacent the other, and
yieldable mounting means for said beads mounted at their ends on said disks and mounting said beads for free rotation with respect thereto and for flexible movement toward and from each other and flexing to conform said beads to the parts of the body between said hand grips and supporting said beads for rotation in an orbital path with sufficient flexibility to accommodate certain rows of beads to frictionally engage each other upon pressure on said hand grips to increase the massaging action of said beads.

4,008,716
GAS DISPENSING ASSEMBLY

William R. Amlong, Miami, Fla., assignor to Safety Laboratories, Inc., Miami, Fla.

Filed Jan. 9, 1975, Ser. No. 539,876
Int. Cl.² A61M 16/00
U.S. Cl. 128—203 10 Claims



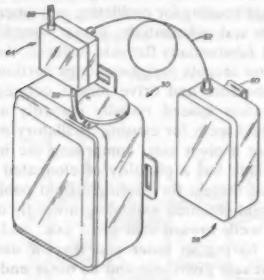
1. A self-contained oxygen dispensing assembly for use in combination with an interchangeable high pressure oxygen supply vessel having an outlet demand valve comprising: a housing defining an inlet passage, having first and second ends and an outlet passage, said first end of said inlet passage having screw means suitable for attachment of said inlet passage to a said interchangeable high pressure oxygen supply vessel

for the supply of oxygen to said inlet passage, said vessel having an outlet demand valve; a supply control means operable to open said outlet demand valve, when said first end of said inlet passage is connected to said vessel, to control oxygen flow from said vessel to said inlet passage; an inlet regulator valve disposed in said inlet passage adjacent said second end to control gas flow from said vessel through said inlet passage; a resiliently biased regulator disposed in said housing at said second end of said inlet passage and including a pressure regulator chamber, said second end of said inlet passage terminating in said pressure regulation chamber, said regulator including means for providing cooperation between said inlet regulator valve and said spring biased regulator for controlling flow of high pressure oxygen from said inlet passage whereby the pressure in said chamber is regulated to a desired pressure, said outlet passage extending from said chamber; and a face mask connected to said outlet passage; wherein said supply control means comprises a member supported in and extending in a sealed manner through said inlet passage to said first end for movement, relative to said first end thereof, to open said outlet demand valve, and said housing is comprised of a connector part which defines said first end of said inlet passage, a regulator housing part connected to said connector part for rotation relative thereto, said regulator housing part cooperating with said member to move said member in response to said relative rotation, said relative rotation being between a position in which said member cooperates with said outlet demand valve to open said outlet demand valve and a position in which said member permits said outlet demand valve to close, and means to restrict said relative rotation to rotation between said positions.

4,008,717
SYSTEM FOR CONTINUOUS WITHDRAWAL AND ANALYSIS OF BLOOD

Allen A. Kowarski, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 587,724, June 17, 1975, which is a division of Ser. No. 323,985, Jan. 15, 1973, Pat. No. 3,908,657. This application Mar. 5, 1976, Ser. No. 664,178
Int. Cl.² A61B 5/00; A61M 1/00
U.S. Cl. 128—214 R **14 Claims**



1. A system for continuously withdrawing blood from a subject and determining in vivo concentration of biological materials in the blood, comprising,

means insertable into a vein of a subject for providing a passageway for blood being withdrawn from the subject,

means engaging only an extra-corporal section of said passageway-providing means for controlling the withdrawing of the blood slowly from the vein at a predetermined constant rate and for a predetermined extended period,

means connected to an extra-corporal section of said passageway-providing means for causing diffusion of a diffusible substance of the blood into an amount of diluent, and

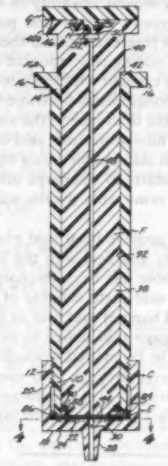
means for detecting and measuring the concentration of said diffused substance whereby said means responds by the generation of electrical energy in relation to the concentration of the diffused substance, and

wherein all blood engaging portions of the system are non-thrombogenic.

4,008,718
LIQUID FILTERING AND DISPENSING ASSEMBLY

Isadore Pitesky, 4001 Linden Ave., Long Beach, Calif. 90807

Filed Feb. 26, 1976, Ser. No. 661,835
Int. Cl.² A61M 5/00
U.S. Cl. 128—218 R **10 Claims**



1. A portable hand-operated device capable of being manipulated by a hand of a user to dispose a quantity of a liquid therein, which quantity of liquid may contain particles of solid material and have an air bubble situated thereabove, and thereafter discharge a desired metered quantity of said liquid free of air and said particles of foreign material therefrom into a desired container or through a hypodermic needle that includes a head in which a tapered recess is defined, said devices including:

a. an elongate cylindrical barrel that has a first end portion on which external threads are defined, and a second end portion that includes an outwardly extending flange that may be engaged by the fore finger and middle finger of said hand;

b. a cup that includes a circular web that has an internally threaded cylindrical side wall extending from the periphery thereof, said web including first and second sides; said first side having a plurality of spaced grooves defined therein; said cup including a tapered first protuberance that extends outwardly from said second side, with said first protuberance having a longitudinal first bore therein that is in communication with said grooves, said first protuberance capable of removably and sealingly engaging said tapered recess in said hypodermic needle head to support said hypodermic needle from said cup, and said internally threaded side wall engaging said external threads to removably support said cup on said barrel;

c. a flat circular filter assembly that includes a screen that rests on said first side and a filter membrane mounted on said screen, said screen and membrane of such diameters as to extend under said first end portion of said barrel, said screen cooperating with said grooves to define a plurality of passages through which said liquid that has been filtered may flow to said first bore;

d. a first resilient sealing ring in said cup that is deformed by pressure contact with the extremity of said first end portion to seal with an outer circumferential portion of said membrane;

e. an elongate ram having first and second longitudinally aligned portions that at their junctions define a circular body shoulder, said first portions of such diameter as to

slidably engage the interior of said barrel, said first portion having a first free end surface and said second portion a second free end surface, a longitudinal second bore in said ram that extends between said first end and a cavity that extends inwardly in said ram surface from said second free end surface thereof, said body shoulder acting as a stop when it engages the outer extremity of said second portion of said barrel to prevent said first free end surface of said ram pressure contacting said membrane when said ram is moved inwardly in said barrel, and a circumferential groove in said first portion of said ram adjacent said first free end surface thereof;

f. a second resilient sealing ring mounted in said groove and in slidable sealing contact with the interior of said barrel, with said second longitudinal bore and cavity allowing air from said air bubble to escape to the ambient atmosphere when said ram is moved towards said cup, and the expulsion of all air from said bubble being signaled when liquid from said barrel starts to discharge into said cavity;

g. a plate that may removably overlie said second free end of said ram; and

h. first means that project from said plate and removably engage said cavity and seal with the latter after said air from said air bubble has been discharged from liquid in said barrel, with said plate capable of being engaged by the thumb of said hand of said user as said fore finger and middle finger engage said flange to permit said first free end of said ram to be moved towards said cup to force liquid in said barrel through said membrane, with said liquid flowing through said membrane discharging into said passages to flow therefrom into said first longitudinal passage.

4,008,719

OSMOTIC SYSTEM HAVING LAMINAR ARRANGEMENT FOR PROGRAMMING DELIVERY OF ACTIVE AGENT

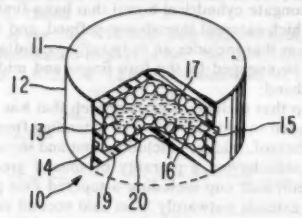
Felix Theeuwes, Los Altos, and Atul D. Ayer, Belmont, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Feb. 2, 1976, Ser. No. 654,195

The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.² A61M *31/00*

U.S. Cl. 128—260 **63 Claims**



1. An osmotic system for dispensing an active agent to an environment of use, said system comprising:

a. a shaped wall comprising a pair of laminae which laminae comprises an exterior lamina consisting of a multiplicity of materials blended to form a lamina that is permeable to the passage of an external fluid and which lamina maintains its physical and chemical integrity in the environment of use, and an interior lamina consisting of a multiplicity of materials blended to form a lamina that is permeable to the passage of an external fluid, substantially impermeable to the passage of agent and which lamina maintains its physical and chemical integrity in the presence of agent, said wall surrounding, with the interior lamina facing;

b. a compartment containing an active agent that is soluble in the fluid and exhibits an osmotic pressure gradient across the wall against the fluid;

c. a passageway in the wall communicating with the compartment and the exterior of the device for dispensing agent from the device; and

d. wherein in operation when the device is in the environment of use, fluid from the environment is continuously inbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously dissolving agent which is dispensed through the passageway at a controlled and continuous rate over a prolonged period of time.

4,008,720

BLADE WITH IRRIGATION TUBES

Paul Brinckmann, Rinscheweg 11, 44 Munster; Joachim-Ulrich Krenz, Lindenstr 24, 4401 Roxel, and Werner Ruck, Am Edelkamp 15, 4401 Holenholte, all of Germany

Filed June 2, 1975, Ser. No. 582,633

Claims priority, application Germany, June 8, 1974, 2427716

Int. Cl.² A61B *17/14*; B26D *7/08*

U.S. Cl. 128—317 **7 Claims**

1. In a bone saw having a housing, a saw blade movably supported on said housing for oscillating movement, the blade being of a thin and substantially planar sheetlike material having opposed substantially flat side surfaces, the blade having thereon, outer arcuate peripheral edge portion having saw teeth formed thereon, and drive means connected to said blade at a location spaced radially inwardly a substantial distance from said teeth for causing oscillatory movement of said blade about a pivot axis, comprising the improvement wherein said blade has a plurality of elongated distributing channels formed therein for guiding a fluid cooling medium therethrough, said channels extending inwardly of said blade from said saw teeth toward said pivot axis, said distributing channels each having an inner end thereof disposed more closely adjacent said pivot axis and an outer end thereof disposed more closely adjacent said teeth, a supply channel formed in said blade and communicating with said one end of each of said distributing channels, said supply channel being adapted for connection to a source of said cooling medium, said blade having a plurality of openings extending axially therethrough from one side surface of said blade to the other side surface thereof, said openings being disposed closely adjacent but spaced radially inwardly a small distance from said saw teeth, each said distributing channel having said other end thereof in open communication with one of said openings, diverter means fixedly associated with said blade and disposed adjacent the radially outer edge of each said opening for deflecting the cooling medium discharged from said other end of said distributing channels sidewardly in opposite directions so that said cooling medium flows outwardly through opposite ends of each said opening and then flows along the opposite side surfaces of said blade and along the opposite sides of said saw teeth.

4,008,721

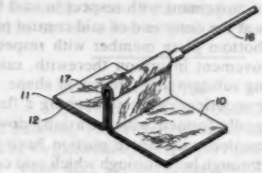
TAPE ELECTRODE FOR TRANSMITTING ELECTRICAL SIGNALS THROUGH THE SKIN

Charles V. Burton, Wayzata, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 14, 1975, Ser. No. 567,612

Int. Cl.² A61N *1/04*

U.S. Cl. 128—418 11 Claims



7. A tape electrode for prolonged adhesion to the epidermal layer of skin of a human, and re-adherable should it loosen in use without removal by application of a non-aqueous solvent to the adhesive free side thereof comprising: A highly porous flexible tape substrate; and an electrically conductive coating on one surface of said substrate, said conductive coating including a mixture of skin compatible metal particles blended into a water insoluble, and at least partially volatile organic solvent soluble, low-tack adhesive matrix in an amount sufficient to provide electrical continuity between the metal particles, and to produce a coating that is essentially tack free, said adhesive matrix being an acrylic copolymer and said coating being less than 5 mils in thickness, said thickness of said adhesive matrix coating being such that water vapor generated at the surface of the skin readily permeates through said coating layer and tape substrate.

4,008,722

SHAKER FOR HARVESTER-THRESHER

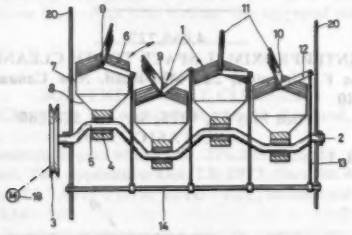
Wilhelm Jakobi, Bogenweiler, Germany, assignor to Maschinenfabrik Fahr Aktiengesellschaft Gottmadingen, Gottmadingen, Germany

Filed May 19, 1975, Ser. No. 578,943

Claims priority, application Germany, May 20, 1974, 2424520

Int. Cl.² A01F *12/30*

U.S. Cl. 130—26 13 Claims



1. In a harvesting machine wherein grain-carrying stalks are shaken to separate the grain from the stalks by a plurality of parallel horizontally elongated and vertically reciprocating shaking elements, the improvement comprising:

a flat plate extending above, all across and parallel to each of said shaking elements,

means on each of said elements defining a pivot axis for the respective plate parallel to the respective element, and

operating means for oscillating said plates back and forth pivotally about their respective axes as said shaking elements reciprocate vertically.

4,008,723

SMOKING MIXTURE

James Borthwick, Glasgow, and James Forrester Morman, Troon, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 125,872, March 18, 1971, Pat. No. 3,885,574. This application Mar. 11, 1975, Ser. No. 557,255

Claims priority, application United Kingdom, Mar. 23, 1970, 13860/70

Int. Cl.² A24B *15/00*

U.S. Cl. 131—2 13 Claims

1. A smoking mixture in fabricated form comprising

a. as smoke producing fuel a solid combustible tobacco substitute material which material is non-toxic on pyrolysis and is selected from the group consisting of carbohydrates selected from the group consisting of cellulose, sucrose, glucose or an alginate and aldol condensation products prepared by acid- or base- catalysed condensation of a compound of the formula

$$R^1COCH_2.CH_2COR^2$$

or a precursor thereof wherein R^1 and R^2 which may be the same or different each represents a hydrogen atom or an alkyl, hydroxyalkyl or formyl group;

b. a harmless filler, and

c. sufficient binder to enable the mixture to be fabricated, said filler being harmless on pyrolysis and present in a proportion of 40 to 65% by weight of the mixture and being selected from salts wherein the anion comprises formate, oxalate, citrate, tartrate, silicate, carbonate, chloride, sulphate, phosphate, borate, oxide, dioxide or aluminate and the cation comprises sodium, potassium, calcium, magnesium, iron or titanium, the combination of cations and anions in the filler being selected to impart a burning rate correlated to a puff number of 8–12 of a machine-made standard Class B British cigarette containing 1.1 g tobacco, where each puff is of 25 ml volume in two seconds, followed by a 58 second rest or smouldering period and where the 70 mm cigarette is smoked to a butt length of 20 mm.

4,008,724

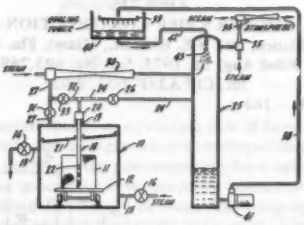
METHOD AND APPARATUS FOR TREATING TOBACCO

Leonard T. DeCoursey, R.R. No. 3, Hardinsburg, Ky. 40143

Division of Ser. No. 426,112, Dec. 19, 1973, Pat. No. 3,931,825. This application Nov. 18, 1975, Ser. No. 633,164

Int. Cl.² A24B *3/12*

U.S. Cl. 131—133 A 3 Claims



1. Apparatus for moistening tobacco, said apparatus including, in combination,

a gas-tight chamber of a size large enough to receive a mass of tobacco to be moistened,

an evacuation probe associated with the chamber and movable from a retracted position in which it is out of contact with the mass of tobacco to be moistened in the chamber to an extended position in which it penetrates said mass of tobacco,

said probe being connected to first vacuum means,

said first vacuum means being effective to lower the absolute pressure in said chamber from atmospheric down to about, but not substantially less than 1 inch Hg absolute, but, in any event, to an absolute pressure greater than the flash point of the tobacco being moistened,

second vacuum means,

said second vacuum means including a steam ejector and condensing means therefore and being effective to lower the absolute pressure in the chamber from a maximum of about 2–3 inches Hg absolute down to an absolute pressure of about 0.2 inch Hg absolute, but, in any event, to an absolute pressure less than the flash point of the tobacco being moistened,

first valve and conduit means operable, during an initial evacuation, to connect the chamber to said first vacuum means and to at least partially by pass connection of said chamber to said second vacuum means,

second valve and conduit means, operable after the aforesaid maximum absolute pressure of about 2–3 inches Hg absolute is reached, to connect said second vacuum means and said first vacuum means to said chamber wherein tobacco within said chamber is subjected to the combined effects of the first and second vacuum means, and thereby said tobacco is subjected to an absolute pressure below its flash point,

means for thereafter admitting steam to the chamber while evacuating only through said probe at a rate which causes the absolute pressure in the chamber to increase from a level less than the flash point of the tobacco to a maximum upper level which corresponds to the temperature at which the tobacco can be deleteriously affected by the temperature which corresponds thereto,

said second valve and conduit means being operable to disconnect said second vacuum means from said evacuation system prior to the aforesaid maximum absolute pressure thereof is reached, and after attachment of the minimum effective absolute pressure of the first vacuum means is reached,

means for thereafter subjecting said tobacco to a substantially constant pressure while simultaneously steaming into the chamber while evacuating only through the probe,

means for thereafter lowering the absolute pressure to which the tobacco is subjected to a level within the capacity of the first vacuum means by evacuating solely through the probe, and

means for thereafter controllably increasing the absolute pressure to which the tobacco is subjected to atmospheric.

4,008,725

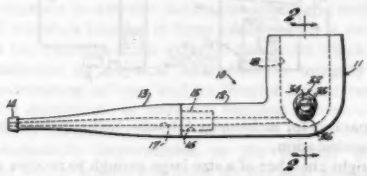
SMOKER'S PIPE CONSTRUCTION

Francisco Blanco, 501 N.E. 69th St., Miami, Fla. 33138

Filed Aug. 11, 1975, Ser. No. 603,768

Int. Cl.² A24F *3/02, 9/02*

U.S. Cl. 131—184 A **2 Claims**



1. In a smoker's pipe, the combination comprising, a tobacco bowl portion, a pipe shank portion integrally formed with and extending outwardly of said bowl portion, a bottom plate member within said bowl portion and serving as a grate for supporting tobacco to be burned in said bowl portion when the pipe is being smoked, said bottom plate having peripheral edge portions in close proximity to inner wall portions of said tobacco bowl portion, and manually controllable means for rockably and rotatively supporting said bottom plate with respect to said pipe bowl portion to scrape away the charred remnants and ash of consumed tobacco after a smoking session, said manually controllable bottom plate supporting means comprising a control pin extending laterally outwardly of one side of said bowl portion, means journalling said control pin for rotative movement with respect to said bowl portion, handle means at the outer end of said control pin, means for securing said bottom plate member with respect to said control pin for movement in unison therewith, said bottom plate member being substantially circular in shape, said bottom plate member securing means comprising a flat support plate portion integrally formed with an axially downwardly-extending sleeve portion, said sleeve portion having a transversely-extending through bore through which said control pin is received, and a jam screw threadingly engaged within said sleeve portion and in abutment with a sidewall portion of said controll pin.

4,008,726

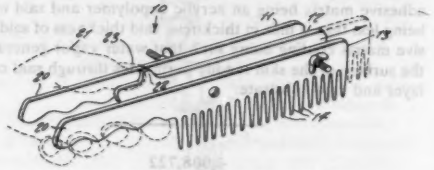
TRI-COMB WAVER

Domenico M. DiGiuseppe, 400 So. Main Street, Mehanicville, N.Y. 12118

Filed Oct. 10, 1975, Ser. No. 621,288

Int. Cl.² A45D *2/44*

U.S. Cl. 132—9 **3 Claims**



1. An improved comb waver of the type containing a plurality of spaced apart combs wherein the improvement comprises:

means for adjusting the space between the combs, and

means for moving at least one of said combs longitudinally without thereby adjusting the space between the combs, whereby waves of varying tightness can be created through coordinated adjustment of the spacing between combs and longitudinal movement of at least one comb.

4,008,727

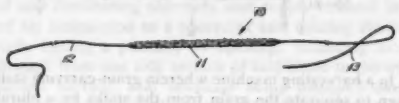
INTERPROXIMAL SPACE TOOTH CLEANER

Thomas F. Thornton, 221 Mill Road, New Canaan, Conn. 06840

Filed May 19, 1975, Ser. No. 578,880

Int. Cl.² A61C *15/00*

U.S. Cl. 132—89 **1 Claim**



1. A teeth cleaner for passage through interproximal space formed between adjacent teeth comprising an elongate flexible string portion and an elongate brush portion secured to the string portion, said brush portion being of spongy elastic material formed to have a cross-sectional extent normally substantially larger than the cross-section extent of the string portion and formed of a plurality of textured, commingled filaments that have been permanently deformed and crinkled, in which

the string portion is formed of a plurality of essentially straight filaments that are unitary with the filaments of the brush part, in which the string portion has two parts, one at each end of the brush portion with both string parts each having an extent that is sufficient to enable grasping thereof by a user and in which there is a hardened covering on at least one of the string portions with the hardened covering being thicker on at least an end extent of the one of the string parts than on the remainder of the string portion with the hardened covering having sufficient thickness to cause the string part extent to be essentially rigid to enable a user to push on the extent.

4,008,728

DENTAL FLOSS HOLDERS

Nicolas S. Sanchez, Vancouver, Canada, assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 27, 1975, Ser. No. 580,807
Int. Cl.² A61C *15/00*
U.S. Cl. 132—92 R **4 Claims**

1. A dental floss holder comprising:
an elongated member with forward and rearward ends and lying in a plane;
first and second like prongs integral at one rearward end with the forward end of the member, the prongs being opposed and extending forwardly, downwardly and outwardly to form a V in a single plane that intersects the plane in which the member lies, each prong having a spiral slot in its forward end;
a hollow, cylindrical reservoir extending rearwardly of the member and bearing a hole through which dental floss can be withdrawn from the interior of the reservoir;
two like opposed outwardly extending post each having a vertical slot and each being attached to the member at points forwardly of the reservoir; and
a spool of dental floss located in the reservoir, with the floss passing out of the hole in the reservoir, passing through the slot in each post and being wrapped around each post and passing through the holes in the prongs and extending between the prongs intermediate the wrapped portions.

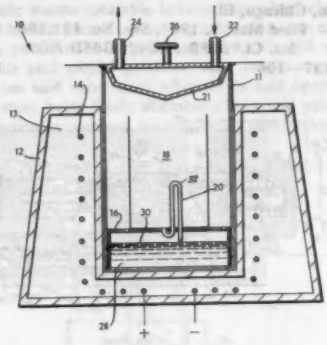
4,008,729

SOLVENT ARTICLE CLEANER

George Chizinsky, 9 Lombard St., South Portland, Maine 04106

Continuation-in-part of Ser. No. 276,229, July 28, 1972, abandoned. This application Oct. 23, 1973, Ser. No. 408,802
Int. Cl.² A47J *31/10;* **B01D** *11/02;* **B08B** *3/08*
U.S. Cl. 134—107 **7 Claims**

1. An apparatus for cleaning articles comprising, a container for volatile liquid solvent, a condensate collector open at the top thereof situated within said container above the liquid level of said solvent, a broad-surfaced liquid cooled condenser mounted in the upper portion of said container above the condensate collector; common heating means including a heating jacket which surrounds said container below said condenser and at least the lower part of the within collector for heating the solvent container and the within collector sufficiently to heat the solvent in the container to boiling, the solvent vapors bathing said articles and liquifying on said condenser and flowing onto said articles in said collector and accumulating therein and sufficiently to heat the liquid in said collector to boiling to vigorously wash components from said articles and means for automatically drawing off said solvent



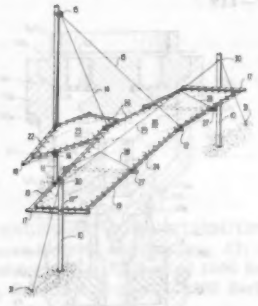
and components from said articles and collector when the condensed solvent has reached a predetermined level.

4,008,730

AIRCRAFT SHELTER AND RIGGING

Ronald Keklak, 637 Church St., Amston, Conn. 06231, and Hubert H. Loewenhardt, 20 Robin St., Pawcatuck, Conn. 02891

Filed Oct. 20, 1975, Ser. No. 624,303
Int. Cl.² E04B *1/342, 1/347;* **E04H** *6/44*
U.S. Cl. 135—5 R **9 Claims**



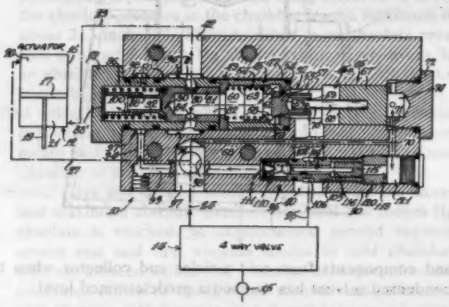
1. An aircraft shelter comprising a pair of fixed upstanding wing tip posts and a single tail post arranged in a triangular array with the single tail post extending for a substantial distance above ground level, a generally horizontal boom disposed substantially midway between said wing tip posts and having its rear end attached to the tail post at an intermediate elevation on the tail post, cross arms on the wing tip posts near the elevation of said boom and substantially parallel to the boom, a single cross arm on said tail post near the elevation of said boom and substantially at right angles thereto, rope suspension means for said boom on said tail post and stabilizing the forward end of the boom, generally horizontal rope rigging interconnecting said boom with the cross arms of the wing tip posts, additional generally horizontal rigging connected with the cross arm of the tail post and the first-named rigging, and fabric aircraft wing and tail area coverings secured to said riggings, said boom underlying said fabric coverings.

4,008,731

COUNTERBALANCE VALVE

Sherwin D. Katz, Skokie, Ill., assignor to I-T-E Imperial Corporation, Chicago, Ill.

Filed Mar. 8, 1971, Ser. No. 121,784
Int. Cl.² F15B *13/042*; G05D *7/00*
U.S. Cl. 137—106 **10 Claims**



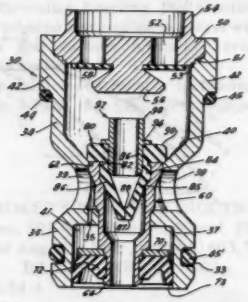
1. A counterbalance holding valve assembly comprising: passage means defining a fluid flow path, a check valve member in said passage means for blocking flow in one direction therein, pilot-operated means for opening said valve member, valve means in said passage means for maintaining the pressure drop across the valve member substantially constant, and means responsive to the pressure drop across the valve member for controlling said valve means.

4,008,732

DIVERTER VALVE

Barry S. Fichter, Louisville, Ky., and Lane Scot Duncan, Lakewood, Ohio, assignors to American Standard, Inc., New York, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,946
Int. Cl.³ F16K *11/06*, *31/383*
U.S. Cl. 137—119 **16 Claims**



1. A diverter valve assembly having a housing open at both ends and valve elements therein for mounting in fluid communication between a fluid inlet and a pair of outlet openings to conduct fluid through one outlet of the pair in a non-diverted mode and the other outlet of the pair in a diverted mode out of a diverter conduit, comprising:

a first cup-shaped tubular chamber, a second cut-shaped tubular chamber and an interconnecting conduit between said first and second chambers at the cup portions thereof forming said housing;

said interconnecting conduit having a smaller diameter than said first and second tubular chambers;

said conduit further having at least one port confined to the wall thereof for conducting fluid from said first chamber to said one outlet of said pair of openings in the non-diverted mode;

a tapered tubular member positioned in said interconnecting conduit and adapted to reciprocate in said conduit when said other outlet of said pair of outlets is opened and closed;

a sealing and backflow preventing valve means coupled to one end of said tapered tubular member and which is positioned at the cup portion of said first chamber to divert fluid through said tubular member by flowing the fluid through the opening in said valve means in only the diverted direction when said other outlet of said pair of outlets is opened and simultaneously sealing said valve means at the cup portion of said first chamber in the diverted mode;

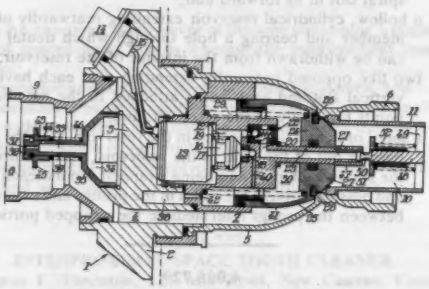
piston means coupled to said tubular member at the end thereof opposite to the end coupled to said sealing and backflow preventing means; and said piston means being disposed in said second chamber below the port so that when said other outlet is opened, fluid entering said first chamber exerts a fluid pressure against said sealing and backflow preventing valve means to shift said tubular member from an open, non-diverted position to a sealing closed, diverted position in said first chamber whereby fluid flows through the tubular member in the diverted flow mode and out of the diverter conduit.

4,008,733

FILLING VALVES FOR PRESSURE FUELING DEVICES

Jacques Courant, Epinay-sur-Seine; Robert Gonnet, Unieux, and Marc Thore, Buc, all of France, assignors to Zenith Aviation, France

Filed Mar. 26, 1974, Ser. No. 454,833
Claims priority, application France, Apr. 17, 1973, 73.13879
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² F16K *21/00*, *31/42*
U.S. Cl. 137—220 **4 Claims**



2. A filling valve for a pressure refueling device comprising: a hollow body; an annular passage in said body between upstream connection means and downstream connection means; a movable closure unit co-operating with a seat in said passage; means in said body for axially guiding said closure unit and co-operating with said closure unit for limiting an outer chamber forming part of the annular passage and an inner chamber communicating with the upstream connection means; control means for opening and closing communication of said inner chamber and a discharge duct; the pressure of the fuel acting on that surface of the closure unit which limits the outer chamber tending to move the closure member away from its seat, and the pressure of the fuel acting on that surface of the closure unit which limits the inner chamber tending to move the closure unit into its seat, and the resulting force exerted on the closure unit in the opening direction being greater than the force exerted in the closing direction when communication with the discharge duct is fully opened by the

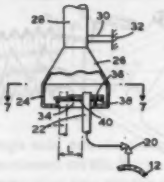
control means and conversely when communication with the discharge duct is fully closed by the control means; and means responsive to the flow rate of fuel across the valve for increasing the ratio between the fuel pressure in the inner chamber and the fuel pressure in the outer chamber as the flow rate increases, wherein said inner chamber communicates with said upstream connection means through port means having a cross-sectional flow area which is controlled by said flow rate responsive means and with said downstream connection means through said control means and said discharge duct.

4,008,734

PRESSURE RELIEF SYSTEM

Nobuo Shimono, and Hideki Marubayashi, both of Kure, Japan, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,859
Int. Cl.² F16L *27/00*
U.S. Cl. 137—314 **5 Claims**



1. In combination with a pressurized vapor containment, means for heating the vapor, said containment being free to move in response to thermal expansion and contraction, a pressure relief valve connected to said containment to release vapor therefrom, a vent pipe connected to said valve to receive the released vapor, a fixed exhaust pipe communicating with said vent pipe to dispose of the vapor being discharged therefrom, and a fixed annular drip pan surrounding the vent pipe and communicating with the exhaust pipe to collect condensate drippings, the pan having an opening sized to allow for relative vent pipe movement occasioned by containment movement, the drip pan opening being covered by upper and lower annular plates surrounding the vent pipe, the lower plate being slidably interposed between said drip pan and upper plate, the lower plate having an opening sized to allow for an initial movement of the vent pipe, and said lower plate being movable to accommodate the remainder of said vent pipe movement.

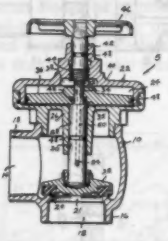
4,008,735

PRESSURE REDUCING FIRE VALVE

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 403,928, Oct. 5, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,342
Int. Cl.² F16K *31/14*
U.S. Cl. 137—495 **5 Claims**

1. A pressure regulating fire valve comprising a body having an inlet chamber associated with a valve inlet and an outlet chamber associated with a valve outlet, a valve seat in said body separating said inlet and outlet chambers and defining a passage between said chambers, a housing connected to said body, said housing positioned above said valve seat and having a chamber formed therein, a valve stem extending from said housing chamber and having a lower end terminating in said outlet chamber, a valve part carried by said valve stem at its lower end engageable with said valve seat, means guiding said valve stem for vertical shiftable movement wherein said valve part is shifted within said outlet chamber into and out of sealing engagement with said valve seat, piston means slidably housed within said housing chamber, said piston means carried by said valve stem and serving to vertically shift said valve stem and said valve part toward said valve seat, said piston means and valve part each having a selected fluid contact area, handle means rotatable between open and closed positions, said handle means contacting said valve stem and urging said valve part into sealing engagement with said valve seat when in its said closed position, said handle means being spaced from said valve stem when in its said open position with said stem being freely shiftable within said guide means for said vertical movement, means placing said outlet chamber



and housing chamber above said piston means in flow communication wherein fluid pressure acting upon said piston means during fluid flow through said valve seat passage in conjunction with the relative fluid contacting areas of said piston means and valve part causes said valve part to be urged by said piston means toward said valve seat thereby creating a selected fluid pressure differential within said inlet and outlet chambers, said piston means and valve part constituting free-floating means for sealing said valve seat at cessation of fluid flow from said inlet chamber into said outlet chamber to prevent fluid back-flow through the valve.

4,008,736

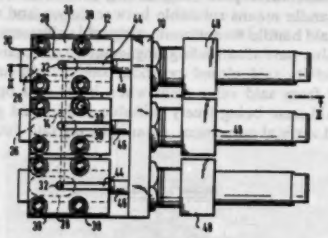
VALVE ARRANGEMENT FOR DISTRIBUTING FLUIDS

Brigitte Wittmann-Liebold, Meisenstrasse 17; Horst Graffunder, Lutzelsteiner Weg 52, both of 1000 Berlin 33, and Heinz Kohls, Bautzener Strasse 4, 1000 Berlin 62, all of Germany

Filed Mar. 10, 1975, Ser. No. 556,855
Claims priority, application Germany, Mar. 21, 1974, 2413703
Int. Cl.² F16K *19/00*
U.S. Cl. 137—606 **4 Claims**

1. A valve arrangement adapted to selectively distribute fluids from a plurality of supply vessels to a receiving vessel comprising in combination at least two supply conduits, each of said supply conduits being connectable to a supply vessel, a common elongated conduit formed in a block, said block having at least one substantially flat surface, said elongated conduit having an output end connectable to a receiving vessel, said elongated conduit further including at least two further openings along the length thereof, said further openings being defined by the intersection at said surface of said block of portions of said conduit upstream and downstream of each said further opening, and at least two valve means, each

said valve means being disposed at said surface of said block between a supply conduit and a further opening for selectively



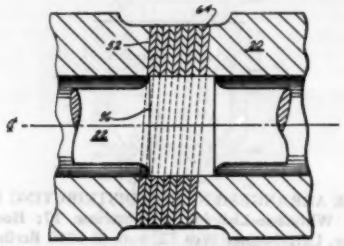
placing said respective supply conduits in fluid communication with the output end of said elongated conduit.

4,008,737

MULTI-PATH VALVE STRUCTURE WITH MEANS PROVIDING SMOOTH FLOW PATTERNS

Matthew L. Kluczynski, Chatsworth, and Myrl E. Orme, Canoga Park, both of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.

Filed Aug. 26, 1974, Ser. No. 500,440
Int. Cl.² F16K *47/08*; F15B *13/04*
U.S. Cl. 137—625.3 **8 Claims**



1. In a flow control valve wherein a spool valve member including at least one land is movable within a sleeve to open and close fluid passageways in said valve, a rigid structure forming part of said sleeve for dividing the flow entering and leaving said passageways into a plurality of streams comprising a stack of laminar disks having abutting faces and internal edge surfaces adjacent said pool member,

said disks including a first group having a pattern of openings therethrough including a pattern of slots affording entry into said stack, a first subgroup of said group being radially oriented in a desired position and a second subgroup of said group being radially displaced from said subgroup such that the openings therein overlap but do not directly register with openings in said first subgroup,

a second group of disks having a pattern of orifices therethrough interposed between members of said first and second subgroups, said orifices individually being of substantially smaller area than said openings and providing communication between members of said first and second subgroups, and

a third group of imperforate disks positioned between selected pairs of disks of said first group for confining flow to generally radial flow patterns across said stack,

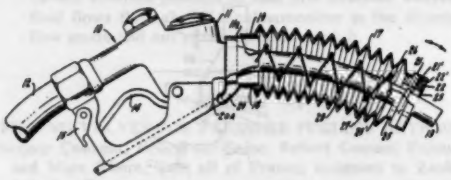
one of said land and said stack of disks being canted relative to the other such that as said land moves past said stack, slots arranged around the inside circumferential edge of any of said disks are progressively uncovered.

4,008,738

LIQUID DISPENSING NOZZLE ASSEMBLY AND METHOD OF USING SAME

Peter P. Moskovich, Gary, Ind., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 26, 1974, Ser. No. 536,533
Int. Cl.² B65B *31/06*
U.S. Cl. 141—5 **42 Claims**



1. A liquid-dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet, said assembly being provided with means to reduce escape of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:

a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;

a flexible vapor collector surrounding, in spaced relation thereto and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with said receiver inlet during said liquid delivery, one end of said vapor collector being attached to said nozzle housing;

a face means located adjacent to and carried by the second end of said vapor collector away from said end attached to said housing for forming a surface seal against the outer surface of said receiver inlet, provided that said spout extends beyond said second end of said vapor collector during said liquid dispensing; and

at least two spring members located in spaced relation therearound said spout and acting to extend said vapor collector means, each of said spring members having one end attached to a different point of said face means so that said face means has substantially free rotational movement transverse to the axis of said spout.

4,008,739

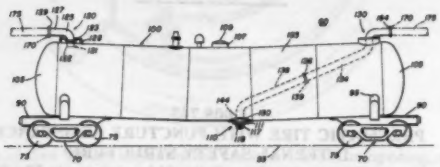
DROP CENTER TANK

Doug Hurst, Montreal West, Canada, and Erling Mowatt-Larssen, Warren, Ohio, assignors to General American Transportation Corporation, Chicago, Ill.

Filed Feb. 24, 1975, Ser. No. 552,651
Int. Cl.² B65B *31/00*; F17D *1/00*
U.S. Cl. 141—35 **11 Claims**

1. A railway tank car for interconnection in fluid communication with associated like tank cars by flexible connecting conduits for accommodating consecutive loading, transporting and unloading of expandable liquid ladings, said tank car comprising a wheeled chassis structure provided with chassis coupling means for coupling to the chassis of associated like cars, a tank mounted on said chassis structure, said tank hav-

ing the bottom thereof sloping downwardly from both ends, a lading vent conduit and a lading eduction conduit respectively coupled to said tank adjacent to the opposite ends thereof and being in fluid communication therewith, each of said lading conduits extending through the top of said tank and having an outer end extending outwardly from said tank adjacent to the top thereof and terminating inboard of the associated tank car end, the inner end of said vent conduit terminating a predetermined distance below the top of said tank, filling of said tank to a level above the inner end of said vent conduit causing compression of gas trapped above said liquid lading to a pressure at which occurs outflow of liquid lading through said vent conduit at the same rate as the inflow of liquid lading through said eduction conduit thereby to provide in said tank above the liquid lading a free vapor space, said eduction conduit extending diagonally downwardly in said tank and terminating closely adjacent to the bottom of said tank to facilitate empty-



ing of said tank through said eduction conduit, a loading and unloading assembly mounted on the bottom of said tank at the center thereof for connection to a source of lading for loading said tank and for connection to an outlet pipe for unloading said tank, the sloping bottom facilitating complete draining without external piping, and conduit coupling means on each of said lading conduits for coupling to an adjacent end of an associated flexible connecting conduit to place said tank in fluid communication with the tanks of adjacent-like tank cars, whereby said tank may be connected by associated flexible connecting conduits to associated-like tanks in a series through which expandable liquid lading may flow to accommodate consecutive loading to a predetermined level, transporting thereof while automatically providing a free vapor space at the top of said tank above the liquid lading, and substantially complete unloading thereof through said eduction conduit.

4,008,740

DISPENSING APPARATUS FOR FILLING DRINKING CONTAINERS

Robert W. Chermack, 14424 Spring Lake Road, Hopkins, Minn. 55343

Filed Sept. 3, 1974, Ser. No. 502,974
Int. Cl.² B65B *1/04*; B02C *13/20*
U.S. Cl. 141—100 **5 Claims**

1. A dispensing apparatus usable with an ice supply for filling a plurality of drinking containers positioned in adjacent, predetermined locations on a tray, comprising:

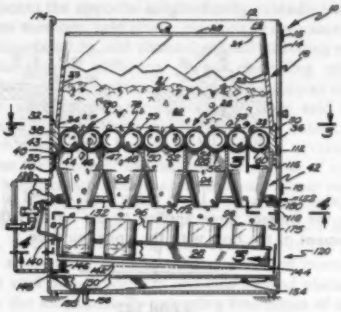
a storage hopper capable of storing the supply of ice in its interior and having a discharge opening at the bottom of said hopper for discharging ice from within the hopper interior;

gate means positioned in blocking relationship with said discharge opening of said hopper, said gate means including a multiplicity of adjacent, rigid, elongated members;

each said elongated member having a longitudinal axis and being disposed in side-by-side relationship with the remaining elongated members with said longitudinal axes of said members being parallel to one another and spaced apart from one another, the distances between said axes being fixed;

each said elongated member including an ice retaining web and each said web having a pair of spaced apart longitudinal cutting edges;

each said elongated member being mounted for rotation about its said longitudinal axis and swingable between a closed position, wherein said longitudinal edges of said adjacent elongated members are positioned closely adjacent each other and said webs define a barrier across said discharge opening obstructing ice flow past said members, and a discharge position wherein said longitudinal edges of said elongated member are spaced from said longitudinal edges of the adjacent said elongated members to define discharge slots between adjacent elongated members with the distance separating said longitudinal edges of adjacent elongated members being greater when said elongated members are in discharge position than when in closed position whereby ice may pass through said discharge slots of said gate means; wherein each said



longitudinal cutting edge of said elongated member is positioned to swing within said hopper and against the ice supply during rotation of said elongated members so as to loosen ice from the ice supply to cause ice discharge from said hopper and through said gate means

gate operating means mechanically connected to said elongated members to simultaneously rotate all said elongated members about their axes between said closed and discharge positions; and

delivery means positioned below said gate means and positionable above a tray and plurality of drinking containers on the tray, said delivery means including a plurality of generally upright chutes, each of said chutes having an inlet below said gate means to receive ice from said hopper and an outlet terminating over a container.

4,008,741

CARPENTER'S TOOL

Frederick W. Holstein, 1331 Howe St., Racine, Wis. 53403

Division of Ser. No. 601,313, July 31, 1975. This application May 20, 1976, Ser. No. 688,158
Int. Cl.² B25C *3/00*
U.S. Cl. 145—46 **3 Claims**

1. A nail set tool for limiting the travel of a nail set toward a workpiece when a hammer blow is applied, said tool having a resilient flexible body with an upper surface for receiving the impact force of a hammer blow, a lower surface for bearing engagement with the workpiece during the application of the blow, means defining a recess at the upper surface of said body, and an elongate hole extending between the recess and said body lower surface for guiding the nail set during the application of the blow, said nail set having an elongate shank extending into the hole with a nail-engaging end located adjacent the lower surface, a head attached to and having a transverse dimension greater than that of the shank and projecting above the upper surface for striking engagement with a hammer, and a boss attached to the shank between the head and the end of the shank and positioned in said recess with an under surface thereof engaged with a bottom of said recess,

resilient means on said body engaging said boss to hold the nail set on said body and said boss against the bottom of said

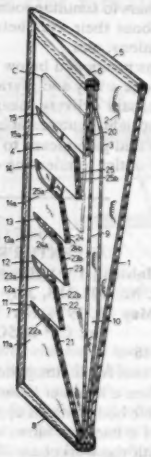
recess and said flexible body being compressed to resiliently oppose the impact force applied to the nail set through the engagement of the boss with the upper surface.

4,008,742

FLEXIBLE RECEPTACLE WITH CREDIT CARD HOLDER

Paul L. Lemler, West Bend, Wis., assignor to Amity Leather Products Company, West Bend, Wis.

Filed Mar. 24, 1976, Ser. No. 669,875
Int. Cl.² A45C 1/06
U.S. Cl. 150—35 3 Claims



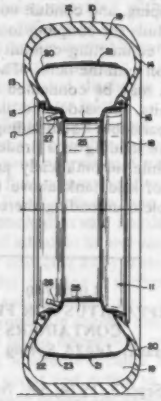
1. A flexible receptacle including a credit card holder for holding a series of credit cards in shingled, overlapping relationship, said credit card holder comprising an outer flexible wall securable to said flexible receptacle and having a series of generally parallel slits which form individual strips in said outer flexible wall, an inner flexible liner comprising a single flexible sheet of single thickness having a periphery and having a plurality of similarly shaped slits therethrough, means for securing said periphery to said outer flexible liner, said slits each including spaced apart side slits and an upper slit joining the spaced apart side slits, so as to form a series of similarly shaped nested flaps each having a free upper edge which can be displaced from the plane of said flexible sheet and said nested flaps each being connected to said flexible sheet at opposite sides, and said flexible sheet being aligned with said outer flexible wall so that said flaps of said liner are located adjacent to said strips in said outer flexible wall, the upper edge of each of said flaps being aligned with one of said parallel slits in said outer flexible wall and whereby individual pockets are formed between said outer flexible wall and said liner to receive credit cards through said parallel slits in said outer flexible wall for resting between said flaps and said liner and for arrangement in shingled overlapping relationship, and means for securing said flaps to said outer flexible wall.

4,008,743

PNEUMATIC TIRE WITH PUNCTURE RESISTANCE INTERNAL SAFETY STRUCTURE

John Alan Welch, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 27, 1975, Ser. No. 608,134
Int. Cl.² B60C 17/02, 17/04, 5/08
U.S. Cl. 152—158 3 Claims



1. A pneumatic tire adapted for mounting on a vehicle wheel rim to define therewithin an annular pressure chamber, comprising:

a toroidal expandable internal safety structure located within said pressure chamber and adapted when said pressure chamber is pressurized to normal tire inflation pressure, to be compressed to a toroidal form of reduced radius and volume within said pressure chamber, and a circumferential radially expandable reinforcing belt having one or more plies, surrounding said safety structure and secured thereto in a relatively narrow central circumferential zone to avoid restraint of said safety structure when said safety structure expands, the plies of the belt also joined to each other in a relatively narrow circumferential zone to avoid restraint of the safety structure when said safety structure expands whereby in the event of deflation of said pressure chamber, said safety structure and reinforcing belt expands to accommodate operation of said vehicle with said tire in a partially supported condition.

4,008,744

TIRE FAILURE INDICATOR

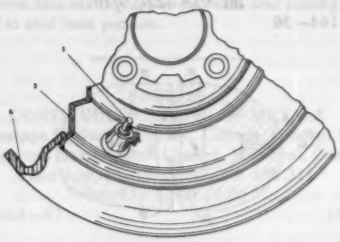
Nicolaos George Botsis; Panayotis Nicolas Korobilis, both of Athens; Ioannis Constantin Miras, Attica, and George Michael Eriparelis, Athens, all of Greece, assignors to Lamir Ltd., Greece

Filed Mar. 14, 1975, Ser. No. 558,562

Claims priority, application Greece, Mar. 14, 1974, 50156; June 7, 1974, 50384; Aug. 22, 1974, 51062; Oct. 5, 1974, 50950

Int. Cl.² B60C *29/00, 23/02*

U.S. Cl. 152—427 10 Claims



1. A tire failure indicator for use in a wheel rim opening, a tire valve extending through the opening, said indicator including a housing means constructed and arranged to be disposed about said opening in surrounding relation to the tire valve, first sealing means for sealing said housing means to the valve and second sealing means for sealing said housing means to the rim in surrounding relation to the opening, the height of said housing means above the rim being less than that of the valve so that the valve extends outwardly of the housing means, and pressure responsive means coupled to said housing means for indicating a pressure rise therein resulting from leakage of air from said rim and through said opening.

4,008,745

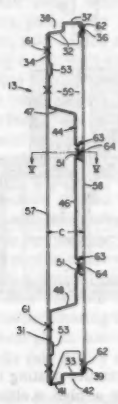
PANELED DOOR CONSTRUCTION

Morris W. Bailey, Fort Worth, Tex., assignor to Overhead Door Corporation, Dallas, Tex.

Filed Feb. 21, 1975, Ser. No. 551,894

Int. Cl.² E06B *3/12*

U.S. Cl. 160—229 R 4 Claims



1. In a multipanel door having a plurality of horizontally elongated and substantially rectangular panels having their adjacent horizontally extending edges hingedly connected to permit movement of said door between a closed substantially vertical position and an open substantially horizontal position, each panel including a horizontally elongated one-piece section member formed from a thin sheetlike material and having a generally channel-shaped cross section when viewed in a plane perpendicular to said horizontal direction, said section member having opposed leg portions of rather short length interconnected by a web portion which has a width several times greater than the length of said leg portions, said leg portions each having a shouldered recess formed therein so that the opposed leg portions of adjacent section members interfit one with the other, comprising the improvement wherein said web portions includes a stiffening portion formed centrally thereof and extending longitudinally throughout the length of said section member, said stiffening portion being of a generally channel-shaped cross section which opens outwardly in a direction opposite to said channel-shaped section member, said web portion also includes a pair of substantially planer portions which are spaced from one another and disposed adjacent the opposite longitudinally extending edges of said section member, said planar portions being spaced apart and interconnected by said channel-shaped stiffening portion, the channel-shaped stiffening portion including relatively short leg parts which are connected to the adjacent edges of the planer portions and project inwardly into said section member, said leg parts being interconnected by a substantially planar web part which has a width which is several times greater than the length of said leg parts, the width of said web parts also being greater than the width of said planer portions, said web part being disposed substantially parallel to said planer portions but spaced both transversely and laterally therefrom, said web part being disposed between but spaced from first and second parallel planes, said first plane being defined by said planer portions and said second plane being defined by the longitudinally extending free edges of said leg portions, said web part being positioned more closely adjacent said second plane so that said channel-shaped stiffening portion has a depth which is at least approximately 70% of the depth of the panel, each panel also including a pair of end stiles fixedly connected to the opposite end edges of the section member, said end stiles extending in a direction perpendicular to said horizontal direction, each said panel further including at least one intermediate stile which is disposed between and substantially parallel to said end stiles, said intermediate stile being disposed adjacent the open side of said section member and fixedly interconnected thereto, said planar portions and said planar web part each having a channel-like rib formed therein and extending longitudinally therealong, said ribs projecting rearwardly of said section member toward said second plane, and said stiles all having means thereon directly fixedly interconnected to the rib of said planar web part.

4,008,746

OPENABLE GATE END FOR WIRE TRACTION GATE

Felix B. Romberg, P.O. Box 218, Holland, Tex. 77001

Division of Ser. No. 459,810, April 10, 1975, Pat. No. 3,977,457, which is a continuation-in-part of Ser. No. 270,308, July 10, 1973, Pat. No. 3,825,053. This application Feb. 12, 1976, Ser. No. 657,578

Int. Cl.² E06B *3/80*

U.S. Cl. 160—328 6 Claims

1. For use at the openable end of a wire traction gate in conjunction with a gate post and the wire barrier of the gate:

a standard for supporting one end of said wire barrier and positionable adjacent said post in an upright position,

said standard comprising an open sided shaft with a pair of broad parallel side walls and a narrow connecting wall,

a pivot block replacing said narrow connecting wall at the upper end of said shaft,

said pivot block being secured to each of said broad side walls and bridging the space therebetween,

means for connecting the lower end of said standard to said post with the standard oriented so the side with the narrow connecting wall and pivot block faces said post,

a traction lever defining an endwise facing socket at one end for receiving and pivoting about said pivot block between the broad side walls of said standard,

a pair of traction links,

means for connecting one of the ends of said traction links with said post for pivotal movement in a vertical plane,

the other ends of said pair of traction links being connected, one on each side, with said traction lever at its fulcrum for pivotal movement of said traction lever from an up-ended position on said pivot block to an over center terminal position in toggle action forcing said pivot block and therewith said standard toward said post.

4,008,747

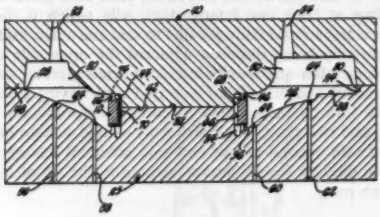
METHOD FOR LOCATING INSERT IN CAST IRON

Melvin W. Devers, Bay City, and William L. Felske, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 520,498, Nov. 4, 1974, Pat. No. 3,928,963. This application Sept. 15, 1975, Ser. No. 613,473

Int. Cl.² B22D *19/00*

U.S. Cl. 164—9 **2 Claims**



1. A method for manufacturing a cast metal member with containment ring comprising: the steps of preforming a metal ring to have spaced apart parallel side walls each including an annular groove formed continuously circumferentially thereabout, forming a core box having a planar extent including a first reference surface therein surrounded by a plurality of circumferentially spaced upstanding posts, centering the metal ring to locate the posts on said core box in alignment with one groove on one side of said ring to provide a three point location of said ring with respect to said reference surface therein, forming a core box cover having a second reference surface thereon surrounded by a plurality of circumferentially spaced posts thereon each located radially outwardly of said second reference surface and being located within the other groove of said ring when the cover is placed on said core box, directing core sand into said core box for forming a sand core continuously around the inside and outside diameter of said ring for thermally insulating the exposed surfaces of said ring, withdrawing said posts to form a plurality of holes directed into either side of said core each in communication with one of said grooves, placing the core into a mold box, directing molten metal into the mold to fill the holes formed in the sand core around said metal ring whereupon solidification of the cast metal will form an in situ plurality of integral posts between the cast metal and the ring to locate the ring internally thereof.

4,008,748

METHOD OF INSERTING CORES IN A SAND MOLD

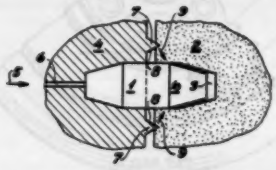
Marius Gunnergaard, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herley, Denmark

Filed Oct. 20, 1975, Ser. No. 623,995

Claims priority, application Denmark, Oct. 23, 1974, 5554/74

Int. Cl.² B22C *9/10*

U.S. Cl. 164—30 **8 Claims**



1. A method of inserting a core having a print in a sand mold provided with a cavity corresponding to the print comprising the steps of inserting the core in the cavity of the sand mold and compressing the sand of the sand mold with an element which produces a recess in a region adjacent to the cavity during said core inserting step.

4,008,749

METHOD FOR LOW-PRESSURE CASTING IN A SAND MOULD

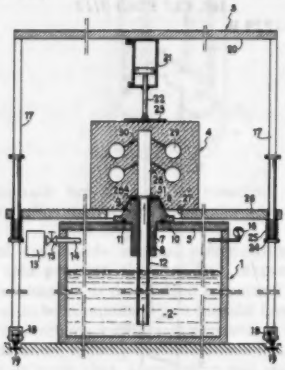
Rio Bellocci, and Michel Degois, both of Pont-a-Mousson, France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Dec. 19, 1975, Ser. No. 642,631

Claims priority, application France, Dec. 24, 1974, 74.42713

Int. Cl.² B22D *17/06*

U.S. Cl. 164—66 **17 Claims**



1. A method for low-pressure casting in a sand mould of in particular a metal having a high melting point, comprising providing a blind sand mould defining a main runner which has an open base portion, a mould cavity and a secondary runner whose cross-sectional area is much less than the cross-sectional area of the main runner, said secondary runner extending from a point of the main runner to the mould cavity; applying a pasty thermosetting refractory coating on the sur-

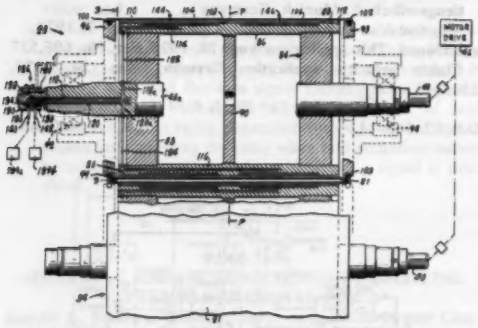
face of the base portion of the main runner; connecting said base portion to a mating upper end of a metal nozzle and a refractory supply pipe which has a cross-sectional area in the neighbourhood of the cross-sectional area of the main runner and partly extends into a fluidtight vessel containing the liquid metal, the lower end of the pipe being immersed in the metal whereby the pasty coating is crushed and hardened into a sealing element; applying a gas pressure exceeding atmospheric pressure on the free surface of the metal contained in the vessel so as to fill the mould cavity with metal under pressure; maintaining the gas pressure until the metal in the secondary runner has solidified; bringing the gas pressure back to atmospheric pressure; and disconnecting said base portion from said mating upper end with said sealing element adhering to said base portion.

4,008,750

CONTINUOUS CASTING OF METALS

Olivo Giuseppe Sivilotti, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 15, 1975, Ser. No. 568,311
Int. Cl.² B22D *11/06*
U.S. Cl. 164—87 **15 Claims**



1. In apparatus for the continuous casting of metal in strip form comprising a pair of moving surfaces which define a mold space between them and continuously travel through return paths to said mold space, at least one of said surfaces being a belt, the combination, with said belt, of a pulley device which carries said belt under tension through a change of direction in its return path while steering the belt against sidewise displacement, said device comprising:

a. a pulley including outer, belt-supporting structure, capable of withstanding the elevated temperature conditions encountered in a casting operation, for engaging said belt in at least two surface zones respectively located on opposite sides of the median plane of the pulley and variable in circumference at least at one of said zones; and

b. means controllable to effect variation in the circumference of said structure at said one zone relative to the circumference of said structure at the other of said zones while said pulley is carrying the travelling belt, for adjusting the transverse profile of the outer surface of the pulley to keep the belt in a desired path on the pulley;

c. said structure being variable in circumference by said controllable means for altering the radius of said pulley at said one zone through an arc of contact of said pulley with said belt while said pulley is carrying said belt under tension.

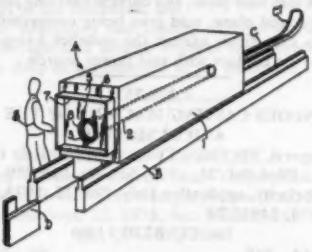
13. In procedure for continuously casting metal in strip form between a pair of moving belts which define a mold space between them and continuously travel through return paths to said mold space, a method of steering one of the belts, comprising continuously advancing the belt through a change of direction over a pulley which is arranged with a belt-carrying surface that can be circumferentially expanded separately at two zones, at least, respectively near the edges of the belt path over the pulley, sensing a tendency of the belt to move laterally on the pulley, and adjusting the lateral contour of said surface through an arc of contact of said pulley with said belt while said pulley is carrying said belt under tension by differentially subjecting said zones to expanding force, for counteracting said tendency of the belt.

4,008,751

CASING FOR A MACHINE FOR CENTRIFUGALLY CASTING PIPES IN A ROTARY MOULD

Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-a-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Feb. 24, 1975, Ser. No. 552,452
Claims priority, application France, Mar. 21, 1974, 74.09744
Int. Cl.² B22D *13/10*
U.S. Cl. 164—153 **9 Claims**



1. The combination of a machine for centrifugally casting a pipe in a rotary mould which is rotatable about an axis and has a socket-forming end portion, and a structure for shielding the mould and protecting against projections of molten metal from the socket-forming end portion of the mould, said structure consisting of a combination of a casing axially fixed with respect to the mould and having a transverse end portion adjacent the socket-forming end portion and defining a permanently open opening which is larger than the socket forming end portion and affords direct access to the socket-forming end portion of the mould, and a screen which is fixed against rotation about said axis and is separate from the rotary mould and axially projects outwardly from the transverse end portion of the casing and extends at least partly around said opening and allows unhindered access to said opening axially of the casing and is capable of receiving at least tangential projections of molten metal from the socket-forming end portion of the mould.

4,008,752

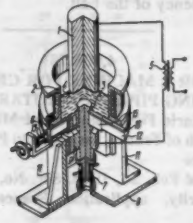
PLANT FOR THE ELECTROSLAG MELTING OF SHAPED CASTINGS

Volf Iudovich Rabinovich, ulitsa Gagarina, 74, kv. 27; Jury Nikolaevich Kriger, ulitsa Oktyabrskaya, 38, kv. 59; Oleg Stepanovich Karpov, ulitsa Gagarina, 19, kv. 4; Viktor Evgenievich Sapunov, ulitsa Gagarina, 60, kv. 10; Vladimir Alexeevich Karpov, ulitsa Gagarina, 43, kv. 39, and Vladimir Yakovlevich Kovenya, ulitsa Gagarina, 84, kv. 12, all of Chekhov Moskovskoi oblasti, U.S.S.R.

Filed Apr. 18, 1975, Ser. No. 569,375
Int. Cl.² B22D *27/02*
U.S. Cl. 164—252 **3 Claims**

1. In a plant for the electroslag melting of shaped castings by electroslag remelting of consumable electrodes in a cooled mold mounted on a base plate having an aperture through which a member to be fused in the course of melting is inserted, the improvement being in that the base plate is of a composite construction split along vertical planes, and that

the molding part of the base plate comprises at least three sections, resilient members connected to each of said sections for forcing the sections against each other and against the member being fused; said mold adapted to accommodate a consumable electrode connected to a power source; means for



the vertical movement of the member being fused said means adapted to insert the member into the slag bath through the aperture in said base plate; and current-carrying jaws movable in the horizontal plane, said jaws being connected to means adapted to urge them against the member being fused and having electric contact with said power source.

4,008,753

CONTINUOUS CASTING MACHINE OF THE WHEEL AND BAND TYPE

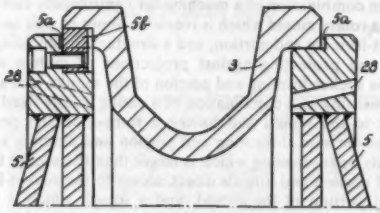
Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy (20122)

Filed Oct. 21, 1974, Ser. No. 516,839

Claims priority, application Italy, Oct. 22, 1973, 30388/73; July 4, 1974, 24812/74

Int. Cl.² B22D *11/06*

U.S. Cl. 164—278 **9 Claims**



1. A continuous casting machine of the type comprising a casting wheel rotatable around a substantially horizontal axis, a peripheral casting ring on said casting wheel, a band covering said casting ring through an arc of said casting wheel, a stationary cooling device arranged internally of said casting wheel for cooling said casting ring and a driving shaft for said casting wheel, wherein said casting wheel comprises two support flanges arranged in spaced relationship and having lateral surfaces facing each other and provided with outer peripheral support surfaces, at least one of said support flanges being connected for rotation with said driving shaft, and wherein said casting ring is spaced from each of said lateral surfaces of said support flanges by an extent greater than maximum axial thermal expansion of said casting ring and comprises outwardly extending peripheral edge flanges each having an outer end portion resting on a corresponding one of said outer peripheral support surfaces freely slideable thereon and freely separable perpendicularly therefrom under thermal expansion of said casting ring, the machine further comprising means between said at least one of said support flanges and the corresponding peripheral edge flange of said casting ring allowing free displacement of said corresponding peripheral edge flange in a direction substantially parallel to the axis of said casting wheel and in a direction substantially radially thereto under thermal expansion and causing torque transmission from said at least one of said support flanges to said casting ring.

4,008,754

PROCESS FOR THE CONSERVATION OF ISOLATED ORGANS AND THE LIKE

Jürgen Kraushaar, Launsbach, and Rolf Voss, Giessen, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Aug. 6, 1975, Ser. No. 602,420

Int. Cl.² F25B *13/00*

U.S. Cl. 165—2 **12 Claims**

1. In a process for conserving isolated organs by the use of low temperatures, characterized in that the organs are rinsed with an inert gas until they are free of water and blood, then the vascular systems for the organs are filled at a slight excess pressure with the inert gas with the vascular openings being closed, the organs then being inserted into a gas tight container having an inert gas atmosphere with a pressure greater than atmospheric being in the container, then the organs in the container are cooled at excess pressure in its inert gas atmosphere to a temperature below −100° C, and finally the organs are stored in the container at this temperature.

4,008,755

LEAK INDICATING APPARATUS FOR A CLOSED COOLING SYSTEM OF AN ELECTRIC MACHINE

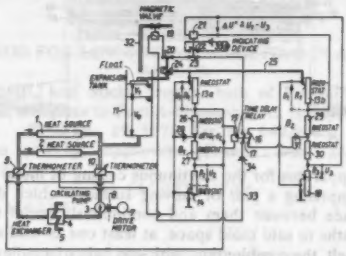
Detlef Vandamme, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 431,162, Jan. 7, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 605,537

Claims priority, application Germany, Jan. 24, 1973, 2303941

Int. Cl.² H02K *9/24*

U.S. Cl. 165—11 **6 Claims**



1. Leak indicating apparatus for the closed liquid coolant circulation circuit for cooling parts of an electrical machine, the liquid coolant changing in volume with changes in temperature in correspondence to a predetermined temperature-volume proportionality, the circulation circuit having an expansion tank wherein the level of the coolant can freely change and a circulation pump having rotating parts with slide ring seals through which the coolant may leak, the expansion tank being disposed at the highest elevation of the circulation circuit, and a coolant supply line for supplying replenishing coolant to the expansion tank, the leak indicating apparatus comprising:

a level measuring device including: level sensing means for monitoring the level of the coolant in the expansion tank and for providing a level-dependent electrical signal indicative of the level of said coolant in said expansion tank;

alarm circuit means for providing a warning signal when there is a deviation from the normal volume-temperature proportionality;

temperature sensing means for detecting the average temperature of the coolant and for translating said average temperature into a temperature-dependent electrical signal;

first comparison circuit means for comparing said level-dependent signal with said temperature-dependent signal;

adjustable means for providing a fine-leak loss signal indicative of the fine-leak quantity permissible in a given time interval;

second comparison circuit means for comparing said level-dependent signal to said fine-leak loss signal;

a time-delay actuator having first and second working contacts and having a time delay corresponding to said time interval, said time-delay actuator being connected to said first comparison means for becoming energized when said level-dependent electrical signal is greater than said temperature-dependent electrical signal thereby actuating said working contacts after said time delay has run out, said first working contact being connected into said second comparison circuit means for energizing the same when said first working contact is actuated;

a valve circuit including: an electromagnetic valve disposed in the coolant supply line for opening and closing said line, and a normally-closed contact;

said second working contact of said time-delay actuator being connected into said valve circuit for closing said valve circuit through said normally-closed contact for energizing said valve to open said supply line when said second working contact is actuated;

said level measuring device further including: means for actuating said normally-closed contact when the level of coolant in said expansion tank has reached an upper limit value; and,

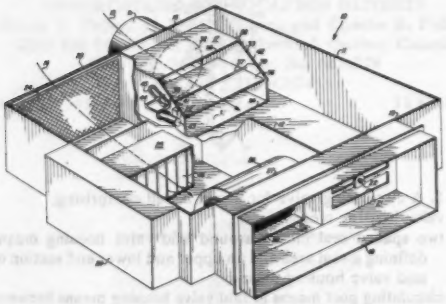
actuation means having a working contact and being connected to said second comparison circuit means for becoming energized when said level-dependent signal is greater than said fine-loss signal thereby actuating said last-mentioned working contact, said contact of said actuation means being connected into said alarm circuit means for energizing the same when said actuation means becomes energized whereby said warning signal is provided.

4,008,756

APPARATUS FOR AIR CONDITIONING EMPLOYING VARIABLE TERMINAL BOX

Jerrold L. Hufford, Phoenix, Ariz., assignor to Armer Construction Company, Phoenix, Ariz.

Filed Dec. 17, 1975, Ser. No. 641,755
Int. Cl.² F25B *29/00*
U.S. Cl. 165—26 **9 Claims**



4. Apparatus for air conditioning an enclosure comprising:

a variable volume terminal box,

said box comprising first and second air flow channels,

each of said channels being isolated from the other and each comprising an input port and an output port,

said input port of said first channel being connectable to a source of cool air under pressure and said output port of said first channel being connectable to a plenum opening into the enclosure,

said input port of said second channel being connectable to a source of heated air and said output port of said second channel being connectable to said plenum,

damping means arranged in said first channel for controlling air flow through said first channel,

first conduit means for connecting the air space of the enclosure to said source of cool air to provide a first closed air flow passageway,

an air flow sensor mounted in said output port of said first channel,

a heating element mounted in said second channel,

an electric blower mounted in said output port of said second channel,

second conduit means for connecting the enclosure to said source of heated air to provide a second closed air flow passageway,

a thermostat for mounting in the enclosure,

means actuated by said thermostat upon a first predetermined reduction in temperature in the enclosure for actuating said damping means to reduce the flow of air through said first channel and upon a second reduction in temperature energizing said electric blower to cause air flow from said source of heated air through said second channel to the enclosure, and

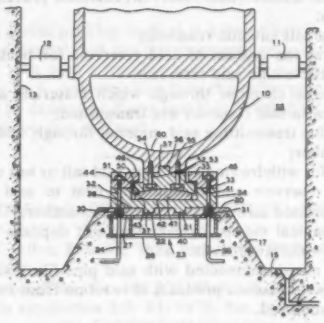
means for energizing said heating element to heat the air flow through said second channel upon predetermined further drop of temperature in the enclosure.

4,008,757

INDUSTRIAL TECHNIQUE

Larry Green Weatherford, Jr., Mount Vernon, Ind., assignor to The Babcock & Wilcox Company, New York, N.Y.

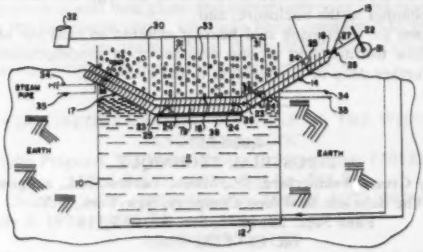
Filed Sept. 22, 1975, Ser. No. 615,318
Int. Cl.² F28F *9/00*
U.S. Cl. 165—67 **4 Claims**



1. A heat-exchanger support comprising a reinforced concrete foundation, anchor bolts embedded within said foundation for transferring vertical loads from the heat exchanger to the foundation, a box spar embedded within said foundation for cooling said reinforced concrete, a base plate resting on said foundation, said base plate having bores formed therein, each of said bores being in alignment with said anchor bolts, said base plate having a generally centrally disposed cylindrical bore that terminates in a base, a lubricated plate member in said cylindrical bore, resting on said base and having a diameter that is smaller than the diameter of said cylindrical bore, said lubricated plate also having a convex surface, an annular shear ring having bores formed in alignment with said respective anchor bolts, said shear ring being superimposed on said base plate and having an inner diameter that is smaller than said lubricated plate diameter in order to overhang a peripheral margin of said lubricated plate, a support block having a concave surface in contact with said lubricated plate convex surface, said support block having a diameter that is greater than said lubricated plate diameter and less than said

cylindrical bore diameter in order to partially underlie said shear ring, and means connecting said support block to the heat exchanger.

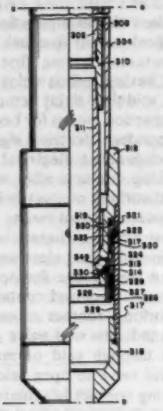
4,008,758
INTERMITTENT ENERGY INPUT SALT BATH CHEMICAL PROCESSOR
Talbot A. Chubb, 5023 N. 38th St., Arlington, Va. 22207
Filed Apr. 17, 1975, Ser. No. 568,972
Int. Cl.[2] F28D *19/00*; F28G *1/08*
U.S. Cl. 165—94 5 Claims



1. A heat-transfer, heat reservoir, chemical processor which comprises:
a salt or salt eutectic reservoir;
means in the bottom of said reservoir for heating a salt eutectic within said reservoir;
a pipe-like chamber through which materials to be processed in said reservoir are transmitted;
means for transmitting said material through said pipe-like chamber;
means for withdrawing heat from said salt or salt eutectic in said reservoir and transmitting heat to said materials transmitted through said pipe-like chamber;
a mechanical means for removing salt deposits from said heat-withdrawal means; and
output means connected with said pipe-like chamber for receiving gaseous products of reaction from said materials processed.

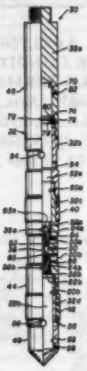
4,008,759
OIL WELL TOOL WITH PACKING MEANS
Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Oct. 31, 1975, Ser. No. 627,632
Int. Cl.[2] E21B *33/12*, *17/02*
U.S. Cl. 166—120 8 Claims

1. An oil well packer assembly for use on a tubing string, said packer assembly comprising:
hydraulic packer means including well gripping means and elastomeric well bore sealing means; and,
hydraulically releasable thermal expansion joint means



sealably and slidably attaching said packer means to a tubing string.

4,008,760
CIRCULATING VALVE
Edward E. DeMoss, Garland, Tex., assignor to Teledyne, Inc., Garland, Tex.
Filed Feb. 25, 1976, Ser. No. 661,250
Int. Cl.[2] F04F *1/08*; E21B *43/12*
U.S. Cl. 166—321 20 Claims



1. A circulating valve for use in a well comprising:
valve housing means;
two spaced seal means around said valve housing means defining a seal area and an upper and lower end section of said valve housing means;
circulating port means in said valve housing means between said spaced seal means;
passage means extending through said valve housing means communicating between said circulating port means and said upper end section;
valve plug means initially maintained in said passage means blocking flow through said passage means;
frangible drawbar means releasably maintaining said valve plug means in said initial position;
upper pocket means in said valve housing means in which said valve plug means is received after said frangible drawbar means breaks; and

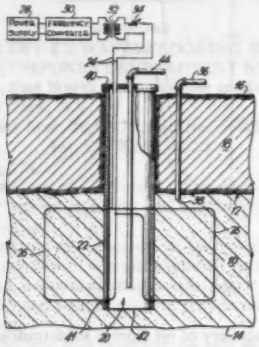
retainer means to retain said valve plug means in said upper pocket means.

4,008,761

METHOD FOR INDUCTION HEATING OF UNDERGROUND HYDROCARBON DEPOSITS USING A QUASI-TOROIDAL CONDUCTOR ENVELOPE

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed Feb. 3, 1976, Ser. No. 654,747
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—248 8 Claims



1. A method of heating hydrocarbons in situ in a selected portion of an underground hydrocarbon deposit such as bituminous and or oil shale, comprising

forming a quasi-toroidal conductor arrangement in the deposit substantially to envelope the said selected portion, and

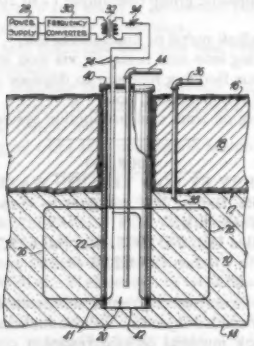
applying alternating current of selected voltage, amperage and frequency to the conductor arrangement to heat the selected portion by induction heating to a selected temperature.

4,008,762

EXTRACTION OF HYDROCARBONS IN SITU FROM UNDERGROUND HYDROCARBON DEPOSITS

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed Feb. 26, 1976, Ser. No. 661,770
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—248 11 Claims



1. A method of extracting hydrocarbons in situ from a selected portion of an underground hydrocarbon deposit such as oil shale, comprising

forming a quasi-toroidal conductor arrangement in the deposit substantially to envelope the said selected portion,

applying alternating current of selected voltage, amperage and frequency to the conductor arrangement to heat the selected portion by induction heating to a temperature sufficient to vaporize a portion of at least one of the hydrocarbon constituents thereof, and

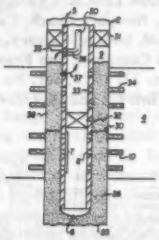
extracting a portion of at least one released hydrocarbon constituent of the deposit by means of a conduit extending from the deposit in the vicinity of the selected portion thereof to the earth's surface.

4,008,763

WELL TREATMENT METHOD

Clovis Carroll Lowe, Jr., Lafayette, La., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 20, 1976, Ser. No. 688,274
Int. Cl.[2] E21B *47/10*
U.S. Cl. 166—253 7 Claims



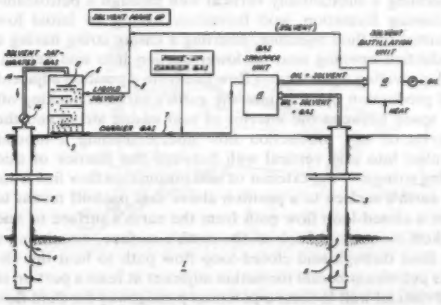
1. In a gravel packing method in a well wherein a plurality of packs are emplaced, the improvement comprising incorporating in each pack a tracer material which is unique to that particular pack, and analyzing fluid thereafter produced from said well to determine if any and if so which pack is leaking solid particles into said well.

4,008,764

CARRIER GAS VAPORIZED SOLVENT OIL RECOVERY METHOD

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 449,136, March 7, 1974, abandoned.
This application July 11, 1975, Ser. No. 594,983
Int. Cl.[2] E21B *43/22*, *43/24*
U.S. Cl. 166—266 21 Claims



1. A method for recovering viscous petroleum including bitumen from subterranean, viscous petroleum-containing formations including tar sand deposits, the formation being

penetrated by at least one production well and by at least one injection well, both wells being in fluid communication with the formation, comprising:

a. passing an inert carrier gas which is gaseous at formation temperature and pressure through a solvent for petroleum which is liquid at formation temperature and pressure to vaporize the solvent thereby forming a gaseous mixture of the solvent and carrier gas;

b. introducing the gaseous mixture of carrier gas and solvent into the formation via the injection well; and

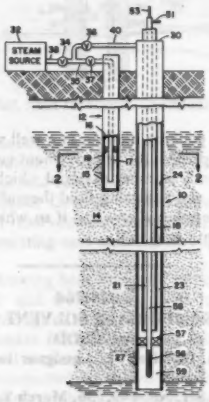
c. recovering a produced fluid comprising formation petroleum, having solvent absorbed therein and the carrier gas from the production well.

4,008,765

METHOD OF RECOVERING VISCOUS PETROLEUM FROM THICK TAR SAND

Donald J. Anderson, Newport Beach, Calif.; Peter Pisio, and Charles F. Kirkvold, both of Calgary, Canada, assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 22, 1975, Ser. No. 643,580
Int. Cl.² E21B *43/24*
U.S. Cl. 166—272 **5 Claims**



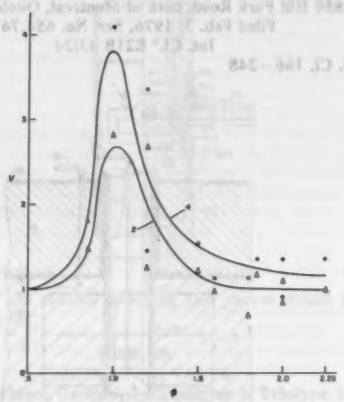
1. A method of assisting the recovery of viscous petroleum from a petroleum-containing formation comprising the steps of forming a substantially vertical well through a petroleum-containing formation, said formation having an initial low potential for fluid injecting, inserting a casing string having a production opening near its lower portion into said vertical well, providing a production flow line from a position adjacent said production opening into the earth's surface, packing off the space between the interior of said casing string and the exterior of said production flow line, extending a tubular member into said vertical well between the interior of said casing string and the exterior of said production flow line from the earth's surface to a position above said packoff means to form a closed-loop flow path from the earth's surface to said packoff means and back to the earth's surface, circulating a hot fluid through said closed-loop flow path to heat the viscous petroleum in said formation adjacent at least a portion of said vertical well to form a potential passageway for fluid flow through said formation and injecting a drive fluid into the upper portion of said formation into said potential passageway to promote flow of petroleum to the production opening near the bottom of said casing string of said vertical well.

4,008,766

OIL RECOVERY BY WATERFLOODING EMPLOYING A BIOPOLYMER-SURFACTANT SYSTEM

Joseph George Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,473
Int. Cl.² E21B *43/22*
U.S. Cl. 166—273 **11 Claims**



1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

a. introducing into said reservoir via said injection system a thickened aqueous liquid containing a water dispersible polysaccharide produced by action of bacteria of the genus Xanthomonas on a carbohydrate and a multifunctional surfactant system comprising a nonionic surfactant characterized by the formula:

$$R\text{-}(OCH_2CH_2)_nOH$$

wherein

R is an aliphatic group or an aliphatic substituted aryl group and

n is a number equal to or greater than 3, and

an anionic surfactant characterized by the formula:

$$R_2\text{—}CO\text{—}N\text{—}CH_2CH_2\text{—}SO_3M$$
$$\quad\quad\quad

a. introducing into said reservoir via said injection system a low tension slug comprising an aqueous medium containing an agent effective to reduce the interfacial tension between said aqueous medium and said reservoir oil, said low tension slug containing a salt additive selected from the group consisting of alkali metal and ammonium sulfates in a concentration of at least 0.2 weight percent to suppress the solubilization of said calcium sulfate into said low tension slug by the common-ion effect,

b. thereafter introducing into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and

c. recovering oil from said production system.

4,008,768

OIL RECOVERY BY WATERFLOODING EMPLOYING MULTICOMPONENT SURFACTANT SYSTEMS

Silvia C. Birk, Fort Worth, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,289
Int. Cl.² E21B *43/22*
U.S. Cl. 166—274 **21 Claims**

1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

a. introducing into said reservoir via said injection system an aqueous solution of a multifunctional surfactant system comprising a surface-active amide linked sulfonate anionic group and a surface-active polyethylene oxide nonionic group,

b. introducing into said reservoir via said injection system an aqueous flooding medium to displace reservoir oil to said production system, and

c. recovering oil from said production system.

4,008,769

OIL RECOVERY BY MICROEMULSION INJECTION

Harry L. Chang, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,236
Int. Cl.² E21B *43/22*
U.S. Cl. 166—274 **15 Claims**

1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

a. contacting a petroleum oil with an aqueous solution of an alkaline agent to extract neutralized organic acids from said oil in said aqueous medium,

b. separating from a portion of said oil, a mixture of oil and the resulting aqueous solution of neutralized organic acids, said mixture containing oil in an amount within the range of 0.5–50 percent by volume,

c. adding to said mixture a co-surfactant having mutual solubility for oil and water in an amount sufficient to form a water external microemulsion,

d. injecting said microemulsion into said reservoir via said injection system,

e. thereafter injecting into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system and,

f. recovering oil from said production system.

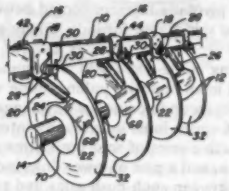
4,008,770

SCRAPER ASSEMBLY FOR GROUND TILLAGE IMPLEMENT DISCS

James A. Boone; Dennis L. Lewallen, both of Quinter, and Harold G. Walker, WaKeeney, all of Kans., assignors to Harold G. Walker, WaKeeney, Kans., a part interest

Filed Apr. 10, 1975, Ser. No. 566,725
Int. Cl.² A01B *15/16*
U.S. Cl. 172—566 **6 Claims**

1. A scraper assembly for cleaning the discs of disc-type ground tillage implements which comprises: bracket means connectable to the implement frame alongside one of the discs carried thereby, said bracket means including shaft-mounting means on the underside thereof adapted to receive a shaft for rotational movement about a substantially horizontally disposed axis; means defining a hanger subassembly having a horizontally disposed leg and a vertically disposed leg, the horizontally disposed leg comprising a first shaft mounted for pivotal movement in the shaft-mounting means of the bracket means and the vertically disposed leg comprising a tubular member open at the lower end thereof hanging down from the first shaft for pendulous movement toward and away from an adjacent implement disc alongside thereof upon rotational movement of said shaft; a scraper blade shaped to scrape the concave surface of an implement disc free of mud and the like when pressed thereagainst; a second shaft depending from the



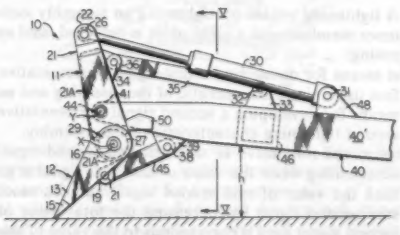
scraper blade mounted for rotational movement within the tubular leg of the hanger subassembly; connecting means detachably mounting the second shaft within the tubular member of the hanger subassembly for limited rotational movement relative thereto, said connecting means including a retaining pin carried by one of said second shaft and tubular members and an oversize pin-receiving opening positioned to receive said pin in the other of said members; biasing means connected between the bracket means and first shaft operative to continuously urge the scraper blade against the concave surface of a disc alongside thereof; and, means comprising a thrust bearing located in the tubular element of the hanger means in engagement with the upper end of the second shaft housed therein, said bearing cooperating with said first and second shafts upon engagement therebetween to relieve the thrust load upon said retaining pin when the scraper blade is under load against the scraper disc.

4,008,771

TWO-WAY BULLDOZER MECHANISM

Uchida Tomio, Sagamihara, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed July 30, 1975, Ser. No. 600,748
Claims priority, application Japan, Aug. 21, 1974, 49-95074
Int. Cl.² E02F *3/76*
U.S. Cl. 172—806 **10 Claims**



5. A two-way bulldozer mechanism mounted on a forwardly extending push frame of an earthmoving vehicle, said push frame having a pair of laterally spaced push arms, said bulldozer mechanism comprising:

a reversible blade assembly having an upper blade portion,

a lower blade portion and a central hinge connection pivotally connecting such blade portions together to permit their relative angular adjustment about said hinge connection;

elongated lever means having opposite ends and a central pivot connection spaced intermediate said ends for pivotally mounting said lever means to said push frame;

means pivotally mounting one end of said lever means to said blade assembly in coaxial relation to said hinge connection so that said hinge connection is movable in an arcuate path about the central pivot connection of said lever means;

motor means operatively connected for pivoting said lever means about its pivot connection between a first angular position wherein said hinge connection is disposed rearwardly of said pivot connection and a second position wherein said hinge connection is forwardly thereof; and

linkage means pivotally interconnected between said blade assembly and said frame for individually positioning said upper and lower blade portions thereof in a predetermined pushing mode when said lever means is in its first position and in an opposite pulling mode when said lever means is in its second position, said linkage means including a pair of upper links individually interconnected between respective ones of said push arms and said upper blade portion, and a pair of lower links individually interconnected between such push arms and said lower blade portion.

4,008,772

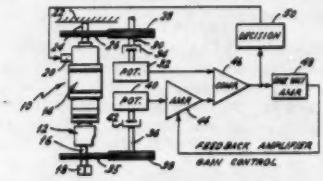
TIGHTENING SYSTEM

John T. Boys, Christchurch, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 19, 1975, Ser. No. 579,108

Int. Cl.² B23Q 5/06

U.S. Cl. 173—12 **16 Claims**



1. A tightening system for tightening an assembly including a fastener member until a yield point is detected, said system comprising:

first means for developing a first signal representative of a first tightening characteristic of the assembly and second means for developing a second signal representative of a second tightening characteristic of the assembly;

third means responsive to said first and second signals for determining when the value of said first signal is greater than the value of said second signal and for modifying said second signal by increasing the total value of said second signal until it corresponds to the value of said first signal, and for developing a decision-making signal when the rate of increase of said first signal decreases with respect to said modified second signal; and

control means responsive to said decision-making signal for developing a control signal when the yield point of the assembly is reached.

4,008,773

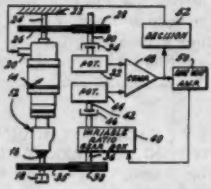
TIGHTENING SYSTEM

Paul W. Wallace, Warrington, Pa., and John T. Boys, Christchurch, New Zealand, assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 19, 1975, Ser. No. 579,109

Int. Cl.² B23Q 5/06

U.S. Cl. 173—12 **18 Claims**



1. A tightening system for tightening an assembly including a fastener member until a yield point is detected, said system comprising:

first means for developing a first signal representative of a first tightening characteristic of the assembly and second means for developing a second signal representative of a second tightening characteristic of the assembly;

third means responsive to said first and second signals for determining when said first signal is greater than said second signal and for modifying said second signal by increasing increments of said second signal to correspond to said first signal, and for developing a decision-making signal when the rate of increase of said first signal decreases with respect to said modified second signal; and

control means responsive to said decision-making signal for developing a control signal when the yield point of the assembly is reached.

4,008,774

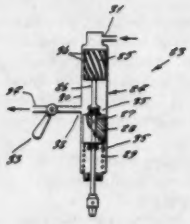
HYDRAULICALLY POWERED DRILL PRESS

Martin B. Milano; David A. Rutherford, both c/o George Spector, 3615 Woolworth Building, 233 Broadway, New York, N.Y. 10007, and George Spector, 3615 Woolworth Building, 233 Broadway, New York, N.Y. 10007

Filed Oct. 22, 1974, Ser. No. 516,971

Int. Cl.² B23B 39/00, 45/04

U.S. Cl. 173—153 **2 Claims**



1. A hydraulically powered drill press comprising a hydraulically powered turbine motor having a rotor and depending shaft affixed thereto, having front and rear ends including means for delivering hydraulic fluid to power the rotor, in combination with a housing encompassing the shaft and rotor including a drill chuck mounted on the front end of said shaft, wherein said housing further includes piston means for forcing the chuck and work axially together, wherein the housing includes inlet and outlet ports spaced axially, said rotor being therebetween and wherein the said piston means is axially

affixed to the shaft at a location between said outlet port, and said chuck wherein the shaft, rotor and piston means are slidably mounted in the housing for axial movement relative to the housing, including bearings to permit rotation of said shaft relative to said piston means, said piston means sealingly engaging the housing to provide differential pressure on said piston thereby facing the shaft axially forward towards the work.

4,008,775

METHOD OF USING A POROUS Fe_3O_4 DRILLING MUD ADDITIVE

Irwin Fox, Ballwin, Mo., assignor to Ironite Products Company, Madison, Ill.

Continuation-in-part of Ser. No. 374,555, June 28, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 666,193
Int. Cl.[2] C09K 7/04
U.S. Cl. 175—64 3 Claims

1. A method of scavenging hydrogen sulfide from drilling mud, which comprises the following steps:

a. adding to drilling mud porous iron oxide particles having an ideal composition of substantially Fe_3O_4 and having a surface area at least 10 times as great as magnetite particles of equal size, the greater part of which particles are no longer than 60 microns, in a quantity sufficient to react such hydrogen sulfide as may be encountered,

b. circulating the drilling mud down the interior of the drill pipe, through the drill bit and up the annular space between the drill pipe and the formation wall to the surface,

c. entraining in the circulating drilling mud such hydrogen sulfide as may be encountered, and

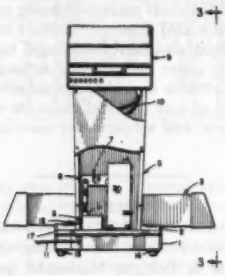
d. reacting the entrained hydrogen sulfide with the said porous iron oxide particles under the pressure there present to form a stable pyrite FeS_2.

4,008,776

ELECTRONIC WEIGHING SCALE

Walter P. Kushmuk, Niles, Ill., assignor to Continental Scale Corporation, Bridgeview, Ill.

Filed Sept. 4, 1975, Ser. No. 610,143
Int. Cl.[2] G01G 3/14, 21/28; H01R 13/70
U.S. Cl. 177—210 R 4 Claims



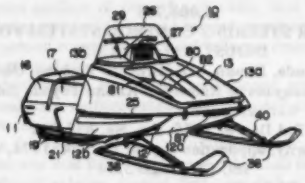
1. A weighing scale comprising in combination a base, a weight responsive movable platform mounted on said base, a housing mounted on said base behind said platform, said housing forming an enclosure extending upwardly substantially higher than said platform, weighing mechanism in said housing connected through an opening in said base to said platform, said weighing mechanism including a variable inductance transducer which generates a signal in response to weight on said platform, and a read-out unit mounted on the top of said housing, said read-out unit displaying weight measurements and being operable in response to said signal, and said weighing mechanism in said housing being supported on said base independently of said housing.

4,008,777

COMPACT SNOWMOBILE

Yasuro Juto, Iwata, and Keisuke Suzuki, Hamamatsu, both of Japan, assignors to Yamaha, Hatsudoki Kabushiki Kaisha, Japan

Filed Oct. 20, 1975, Ser. No. 624,233
Claims priority, application Japan, Oct. 23, 1974, 49-122147
Int. Cl.[2] B62D 27/00
U.S. Cl. 180—5 R 10 Claims



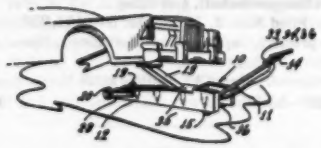
1. In a compact snowmobile comprising an engine room defined at least by a bottom cover fixed to a main frame and a cowl disposed upwardly of said bottom cover, and having a vertical cross section becoming smaller toward a forward end of said snowmobile, a liquid-cooled engine fixed to said main frame and received within said engine room, and a driver seat extending rearwardly from a substantially central portion of the rear end of said engine room and having a cross section smaller in area than a vertical cross section of the rear end of said engine room, wherein the rear end of said engine room is closed at its central portion by said driver seat and has at opposite lateral sides of said driver seat, respectively, a pair of side openings which are opened rearwardly, the improvement further comprising a radiator coupled to said engine for cooling the liquid cooling medium thereof, said radiator being disposed at one side portion of the rear end of said engine room and at least partially extended to one of said side openings, said cowl having an air-intake passageway one end of which is opened in the travelling direction of said snowmobile and the other end of which is opened toward the forward face of said radiator.

4,008,778

SELF POWERED JACK CARRIAGE FOR MOVING DISABLED VEHICLES

Lowell V. Mitchell, 11263 Burbank Blvd., North Hollywood, Calif. 91601

Filed Nov. 10, 1975, Ser. No. 630,401
Int. Cl.[2] B62D 11/04
U.S. Cl. 180—6.5 6 Claims



1. In a self powered carriage including jack means for moving immobile vehicles, the improvement comprising: the carriage comprising a frame for operative reception of a conventional wheeled hydraulic floor jack having jack non-caster forward load bearing wheels and rearward caster wheels, said frame having a forward end with a transversely extending recess to receive and support the front load bearing wheels of the jack in an inoperative restrained elevated position, said frame including a rearward end supported by the rearward caster wheels of the conventional wheeled jack, frame non-caster wheel means mounted on the forward end of said

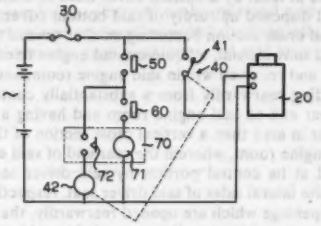
frame, said frame non-caster wheel means comprising a pair of wheels on opposite sides of said frame, means for selectively and independently powering each of said pair of wheels, said means for selectively powering said frame non-caster wheel means comprising at least one electric motor, a source of electric current connected to said motor with circuit interrupting means interposed therebetween, and power transfer means between said motor and said frame non-caster wheel means whereby upon the connection of electric current to said motor, the carriage will be self propelled.

4,008,779

POWER STEERING CONTROL SYSTEM FOR INDUSTRIAL TRUCKS

Akibumi Shinoda, Handa, and Hiroyuki Yoshino, Ohbu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 8, 1975, Ser. No. 638,402
Claims priority, application Japan, Dec. 24, 1974, 49-1576
Int. Cl.² B62D *5/04*
U.S. Cl. 180—79.1 **3 Claims**



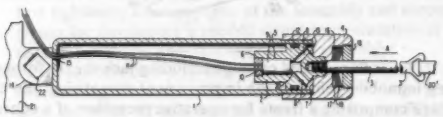
1. An electrically operated power steering control system for an industrial truck comprising an accelerator pedal, battery means, electric motor means for operating said power steering control system, circuit means interconnecting said battery means and said electric motor means, switch means in said circuit operable in response to the depression of said accelerator pedal for closing said circuit means to operate said electric motor means and time delay means to delay the opening of said circuit means after the release of said accelerator pedal.

4,008,780

DEVICE FOR TENSIONING SAFETY BELTS IN VEHICLES

Hellmut Bendler, Nurnberg; Heinz Gawlick, Furth, and Egon Flach, Cologne-Riehl, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Nov. 2, 1973, Ser. No. 411,930
Claims priority, application Germany, Nov. 2, 1972, 2253657
Int. Cl.² B60R *21/10*
U.S. Cl. 180—82 C **16 Claims**



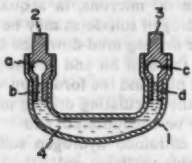
1. Device for tensioning safety belts in vehicles in which one end of the safety belt is securable to the vehicle and the other end of the belt is securable to the tensioning device, said device comprising cylinder means, piston means having piston rod means extending from one side thereof, said piston means and said piston rod means being arranged for displacement within said cylinder means, said piston means being provided with centrally disposed recess means for receiving an electrically ignitable propellant charge cartridge and at least two symmetrically disposed discharge ducts in said piston means connected with said recess means and directed outwardly from said recess means toward the adjacent end wall of said cylinder means at said piston rod means side of said piston means such that upon ignition of the cartridge propellant gases are generated which flow through said discharge ducts into said cylinder means at said piston rod means side of said piston means and against the adjacent end wall of said cylinder means for causing said piston means and said piston rod means to be displaced into said cylinder means to effect a tensioning of the safety belt.

4,008,781

AUTOMATIC VEHICLE-SPEED ADJUSTING DEVICE

Tsurunosuke Ochini, 3169, Kumanohara, Karatsu, Saga, Japan

Filed Oct. 28, 1975, Ser. No. 626,593
Int. Cl.² B60K *31/00*
U.S. Cl. 180—104 **6 Claims**



1. A device for controlling the speed of a vehicle as the latter negotiates a curve comprising a U-shaped tube having two legs joined to a cross over, said U-shaped tube being disposed in said vehicle with its two legs substantially vertically disposed and with the general plane of the U-shaped tube being disposed generally transversely of the longitudinal axis of the vehicle, terminal elements secured in an air-tight manner in the legs of said U-shaped tube, mercury disposed in said U-shaped tube such as to normally contact said terminal elements when the vehicle is moving in a straight path, said terminal elements have vertical internal passages with the lower ends of said internal passages leading to said mercury in said U-shaped tube, said terminal elements have upper closed ends, and enlarged air-chambers in said terminal elements leading from the upper ends of said internal passages, said mercury being movable in said U-shaped tube so as to break contact with one of said terminal elements when the vehicle negotiates a curve and subjects the mercury to centrifugal force.

4,008,782

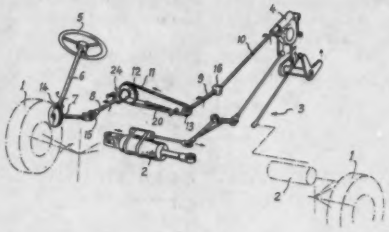
RETURN DEVICE FOR STEERING MECHANISM

Roger Chanal, Saint-Etienne, France, assignor to Etat Francais represente par le Delegue Ministeriel pour l'Armement, Paris, France

Filed Mar. 27, 1975, Ser. No. 562,560
Claims priority, application France, Apr. 1, 1974, 74.12347
Int. Cl.² B62D *5/06*
U.S. Cl. 180—132 **15 Claims**

1. A return device for a hydraulic steering mechanism of a vehicle, the steering mechanism including a steering wheel rotatable with a steering column connected by a line of rotatable shafts to a pair of guide wheels laterally pivotable from a straight-ahead position for controlling the direction of travel of the vehicle, comprising return means for automatically returning the guide wheels to a straight-ahead position after they have been laterally pivoted, the return means including a drum mounted on one of the shafts for rotation therewith; first

resilient means engaging the drum in such a manner that the first resilient means is stressed selectively, depending upon the direction in which the guide wheels are laterally pivoted, by the rotation of the drum when the guide wheels are initially pivoted laterally from a straight-ahead position for providing a resistance to further lateral pivoting of the guide wheels away from a straight-ahead position and a return force to return the



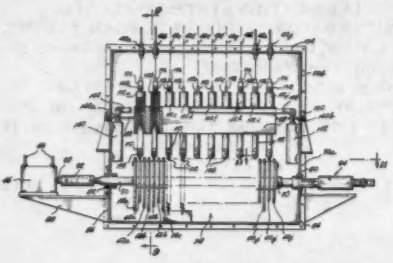
guide wheels to a straight-ahead position; and second resilient means connected to the drum in such a manner that the second resilient means is tensioned by the rotation of the drum for providing, after the first resilient means is stressed by the rotation of the drum, a resistance to further lateral pivoting of the guide wheels away from a straight-ahead position and a return force to return the guide wheels to a straight-ahead position.

4,008,783

HYDRAULICALLY POWERED STEERING SYSTEM FOR A VEHICLE HAVING MULTIPLE STEERABLE WHEELS

Hans H. Herrmann, and Karl H. Herrmann, both of Seattle, Wash., assignors to CTEC Corporation, Bellevue, Wash.

Filed June 19, 1975, Ser. No. 588,421
Int. Cl.² B62D *5/06*
U.S. Cl. 180—140 **10 Claims**



1. In a steering system for a wheeled vehicle including a vehicle frame, a steerable wheel supporting member mounted for rotation about an axis on said frame, a reversible motor means for varying the angular position of said steerable member relative to said frame to steer a wheel supported by said member, a servomechanism operably coupled to said motor means and having a control member for controlling said motor means, an improvement for actuating said control member comprising:

a. a first cam and a second cam, each of said cams having a predetermined shape and a rotational axis,

b. coupling means for interconnecting said cams and for mounting said cams for rotation about their respective rotational axes,

c. an operator controlled steering means operably connected to said coupling means for rotating said cams responsive to a command from an operator,

d. follower means for contacting said first cam and for converting the rotational movement of said first cam into linear movement, said follower means being coupled to actuate the control member of said servomechanism to control said motor means, said follower means including

i. a first member having a channel therein and first means mounting said first member for reciprocating movement in a radial direction relative to the rotational axes of said cams, said channel being oriented generally parallel to the direction of reciprocation of said first member,

ii. a second member mounted for reciprocating movement in the channel of said first member,

iii. a cam follower having an end thereof contacting the cam surface of one of said cams, said cam follower being connected to said second member,

iv. second means biasing said follower means toward said cam surface, and

v. third means for biasing said second member toward said cam surface relative to the position of said first member, and

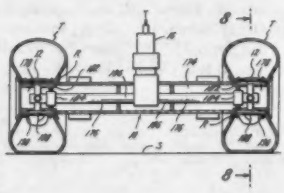
means for relatively axially shifting said first and second cams and said follower means so that said follower means is shifted relative to said first cam and is positioned to contact said second cam and to convert rotational movement of said second cam into linear movement to actuate said control member and control said motor means.

4,008,784

SEISMIC SIGNAL SOURCE

Marvin G. Bays, Houston, Tex., assignor to Seiscom Delta Inc.

Filed June 12, 1975, Ser. No. 586,147
Int. Cl.² G01V *1/14*
U.S. Cl. 181—114 **21 Claims**



1. In a tracked seismic exploration vehicle movable over land surfaces in response to tracks of such vehicle being driven by a drive wheel in the tracks with the vehicle and tracks supported by idler wheels in the tracks, the improvements comprising:

a. signal means for forming a seismic signal in a compressible medium, said signal means mounted with the tracked seismic exploration vehicle; and

b. conduit means mounted with the tracked seismic exploration vehicle for transferring the compressible medium seismic signal from said signal means to a substantially non-compressible fluid within a fluid-filled tire mounted with at least one of the idler wheels for coupling the seismic signal from said signal means through said idler wheel and said fluid-filled tire to the land surface.

4,008,785

TRANSPORT DEVICE FOR MOVEMENT OF AN OPERATOR UP AND DOWN A UTILITY POLE

Fernando Mugnaini, Via Gramsci 73, Colle Val D'Elsa, Siena, Italy

Filed Mar. 5, 1976, Ser. No. 664,413
Int. Cl.² A63B *27/00*
U.S. Cl. 182—133 **11 Claims**

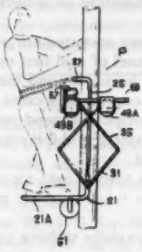
1. A transport device for a operator along a supporting pole comprising

a frame including a footboard for an operator and two upright stem members adapted to flank the pole, a support roller carried by said frame;

two linkages on opposite sides of the frame each including a first pair of X linked rods having an intermediate pivot slidable along a respective stem and a second pair of symmetrical rods pivotably engaged with a fixed pin on such stem;

a pair of drive rollers with parallel axes supported by said two linkages such that the weight of the device and of the operator on the footboard urges the drive rollers towards one another and engages them with pressure against the pole;

and operating means acting on the drive rollers to provide relative movement between said rollers and the pole to move the device up and down the pole.



4,008,786

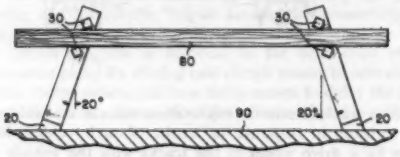
SUPPORT FOR ELONGATED WOODEN PLANKS AND THE LIKE

Joseph M. Canavan, Hermiston, Oreg., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Sept. 15, 1975, Ser. No. 613,109

Int. Cl.² F16M *11/00*

U.S. Cl. 182—186 **3 Claims**



1. A support for an elongated wooden plank, comprising:

two like, hollow elongated, opposed and upwardly and symmetrically inwardly extending legs;

two like flexible protective tips, each located in the bottom end of a corresponding leg;

two horizontally elongated parallel bars which are hollow and square in cross-section, extending between the legs; and

two like, elongated locking pins, each pin being located inside a corresponding leg and extending through aligned holes in each of the bars to secure the bars to the leg.

4,008,787

LUBRICATION SYSTEM

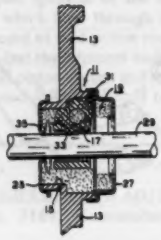
James A. Whitt, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 407,636, Oct. 18, 1973, Pat. No. 3,907,690, which is a continuation-in-part of Ser. Nos. 292,550, Sept. 27, 1972, abandoned, and Ser. No. 292,664, Sept. 27, 1972, abandoned. This application Jan. 24, 1975, Ser. No. 543,835

Int. Cl.² F16N *13/22*

U.S. Cl. 184—12 **23 Claims**

2. In a lubrication system for an apparatus, the apparatus having a lubricant cavity with a bearing assembly disposed therein and also having means for feeding a liquid lubricant supplied thereto to the bearing assembly with the feeding means disposed in the lubricant cavity in association with the bearing assembly; said lubrication system comprising means disposed within said lubricant cavity in interfacing relation with said feeding means for storing said liquid lubricant and for releasing it to effect the supply thereof to said feeding means, said storing and releasing means comprising a mixture of said liquid lubricant, a particulate mass of synthetic fibers, and a particulate mass of discrete non-fibrous, multi-digited, resilient-type foam particles and wherein said particulate mass of said foam particles is generally saturated with said liquid lubricant.



4,008,788

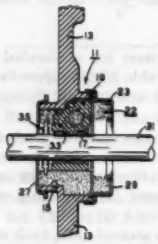
LUBRICATION SYSTEM INCLUDING LUBRICANT-STORING DISCRETE FOAM PARTICLES

James A. Whitt, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 407,635, Oct. 18, 1973, Pat. No. 3,894,956, which is a continuation-in-part of Ser. No. 292,664, Sept. 27, 1972, abandoned. This application Jan. 24, 1975, Ser. No. 543,834

Int. Cl.² F16N *13/22*

U.S. Cl. 184—12 **30 Claims**



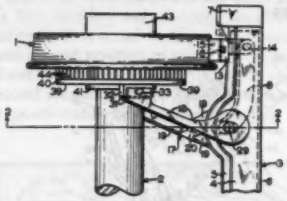
1. In a lubrication system for an apparatus having a bearing assembly in a lubricant cavity therefor; said lubrication system comprising means in said lubricant cavity for storing a liquid lubricant and for releasing it to effect a supply thereof to said bearing assembly, said storing and releasing means comprising a particulate mass of discrete, non-fibrous, multi-digited, resilient-type foam particles generally saturated with said liquid lubricant.

4,008,789

MULTI-BRAKE SHOE MEANS FOR A MULTI-BRAKING SURFACE BRAKED ASSEMBLY

Quentin T. Clemmons, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 17, 1975, Ser. No. 587,740
Int. Cl.² F16D 63/00
U.S. Cl. 188—70 R 12 Claims



1. Multi-brake shoe means for transmitting braking forces to multi-braking surface formed at substantially right angles to each other on an element to be braked, said multi-brake shoe means comprising:

a. a member movable toward and away from the multi-braking surfaces on the element to be braked,

b. a plurality of braking elements each having a braking face via which a braking force is transmitted to a corresponding braking surface when moved into braking engagement therewith, and, wherein the improvement comprises:

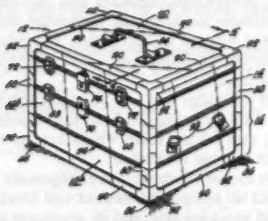
c. a single rigid means rockably mounted on said movable member and having said plurality of braking elements so rockably mounted on and carried by said means so as to enable said plurality of braking elements to transmit braking forces to their corresponding braking surfaces notwithstanding the rate of wear of certain of said braking elements exceeding the rate of wear of certain other of said braking elements.

4,008,790

CAMERA AND LENS CASE

Harrison Eiteljorg, II, 142 Grays Lane, Haverford, Pa. 19041

Filed Aug. 26, 1975, Ser. No. 607,943
Int. Cl.² A45C 11/38
U.S. Cl. 190—44 3 Claims



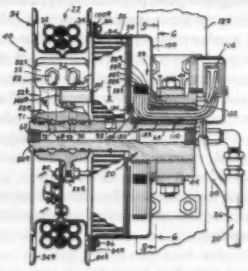
1. A camera and lens case comprising a box-like structure including front, rear, side and bottom panel members defining a lower compartment, front, rear, side and bottom panel members defining an upper compartment, the lower edge of the rear panel member of said upper compartment being hingedly connected to the upper edge of the rear panel of said lower compartment to permit the 180° rotation of said upper compartment into an inverted position, said bottom panel member of said upper compartment being hingedly attached to the lower edge of the front panel member of said upper compartment, means for selectively securing the rear edge of said upper compartment bottom panel member to the lower edge of the rear panel member of said upper compartment, said upper compartment bottom panel member being adapted for opening upwardly to provide access to said upper compartment when said upper compartment is rotated into the inverted position, a lid pivotally attached to the upper edge of the rear panel member of said upper compartment, means for selectively locking said lid in a closed position with respect to said upper compartment to form the top closure means thereof, means for locking said upper compartment in a closed position with respect to said lower compartment to form the top closure means therefor, said front, rear and side panel members of said lower compartment being divisible along a joint lying in a plane parallel with said bottom panel member thereof to form upper and lower sections of said lower compartment, an insert section adapted for insertion between said divisible lower compartment sections to extend the depth of said lower compartment, and means for selectively and demountably securing together said upper and lower or said upper, insert and lower section of said lower compartment.

4,008,791

TAKEUP REEL FOR COMBINED HOSE AND CABLE

Hooshang Shafii-Kahany, Portland, and Larry D. McCart, Lake Oswego, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Sept. 8, 1975, Ser. No. 610,931
Int. Cl.² H02G 11/00
U.S. Cl. 191—12.2 R 5 Claims



1. A takeup reel for combined hydraulic hose and electrical cable, such cable being of the kind including multiple conductive elements, said reel comprising

a rotary storage portion for taking up and paying out such hose and cable,

a mounting member mounting the storage portion for rotation thereon and accommodating attachment of the reel to an external structure,

means accommodating a fluid connection between hose stored on said storage portion and a supply of hydraulic fluid external to said reel, and

means accommodating a brushless electrical connection between cable stored on said storage portion and a supply of electrical energy external to said reel, said means comprising an interface cable including a different conductive element for each conductive element in cable stored on said storage portion, with the interface cable having a coiled portion with elements therein joined in substantial side-by-side contiguity and coiled about said mounting member, and a generally straight portion extending from said coiled portion along a line generally paralleling the rotary axis of said storage portion, and with the elements in said straight portion taking the form of a loose, nonjoined bundle, and

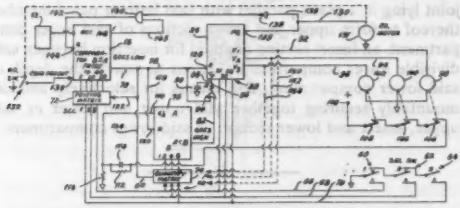
strain relief means attached to said interface cable at the region of joinder of said coiled and straight portions, said strain relief means being mounted on said mounting member for limited rotation about an axis substantially paralleling the rotational axis of said storage portion.

4,008,792

VEND CONTROL CIRCUITS CAPABLE OF VENDING DIFFERENT QUANTITIES AT DIFFERENT PRICES

Joseph L. Levasseur, St. Louis, and Larry D. Lee, Kirkwood, both of Mo., assignors to H. R. Electronics Company, High Ridge, Mo.

Filed Aug. 20, 1975, Ser. No. 606,173
Int. Cl.² G07F 5/22
U.S. Cl. 194—1 N 15 Claims



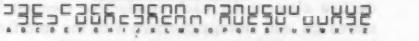
1. A vend control circuit comprising a coin unit for receiving the deposit of coins and for producing output signals to represent the value of each coin deposited, a vendor control system operatively connected to the coin unit including means for producing a vend signal to initiate a vend function whenever the amount entered therein from the coin unit at least equals the total amount of a selected vend, vend producing means operatively connected to the vendor control system and responsive to signals produced thereby, customer actuatable means including means operable to select different quantities of articles at a selectable unit vend price including means to establish the vend price and the quantity of articles to be vended, entry means having a first input operatively connected to the means to establish the quantity of articles to be vended and a second input, said vending producing means including means for generating an output signal for each article that is vended, means connecting the vend producing means to the second input of the entry means, and means to terminate a vending operation when the number of articles vended corresponds to the quantity of articles selected by the customer to be vended.

4,008,793

TYPEWRITING MACHINE

Vittorino Terracina, Vicolo Andrea Doria No. 7, 00187 Rome, Italy

Filed Sept. 7, 1972, Ser. No. 286,944
Claims priority, application Italy, Sept. 8, 1971, 52755/71
Int. Cl.² B41J 1/00
U.S. Cl. 197—1 A 8 Claims



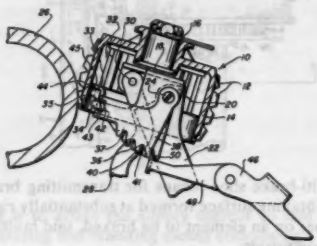
1. A typewriter having a character associated with each of the alphabet letters and numerals thereof, said characters each being formed of the same sign oriented in one of four positions along coordinate horizontal and vertical axes and being located in one of two adjacent horizontal rows thereby being associated with several of said letters, said sign being also located in each of said rows one above the other thereby being associated with the remainder of said letters and said numerals, said sign having a right-angled and U-shaped configuration with three legs of equal length.

4,008,794

TYPE CARRIER PRINT DEFLECTION BLOCKING MEANS FOR A SINGLE-ELEMENT PRINTER

Herbert Decker, Lauf, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Nov. 10, 1975, Ser. No. 630,270
Claims priority, application Germany, Jan. 16, 1975, 2501577
Int. Cl.² B41J 1/60
U.S. Cl. 197—55 7 Claims



1. In a single element printer comprising
a hollow inverted cup-shaped type carrier having type characters on its outer periphery located in rows and columns,
a platen,
a tilt bridge axially supporting said type carrier for rotational movement to position a selected column of type characters opposite said platen, said tilt member having detent teeth thereon,
support means pivotally supporting said tilt bridge for tilting movement about a tilt axis to position a selected row of type characters opposite said platen;
said support means being movable from a rest position to a printing position to impact a selected type character against said platen,
said type carrier on impact experiencing deformation with lower portions tending to move tangentially relative to said platen and support member,
said type carrier having a blocking surface located in a radial plane,
a blocking arm freely pivotally supported on said tilt axis having a radially extending abutment located opposite the platen and proximately beneath and spaced from said blocking surface for arresting tangential movement of said typehead relative to said platen and relative to said support member on impact of a selected type character against said platen,
means on said tilt bridge and said blocking arm for supporting said blocking arm spaced from said blocking surface,
said blocking arm having teeth which extend between the detent teeth on said tilt bridge,
and tilt detent means movable into engagement with detent teeth on said tilt bridge and teeth of said blocking arm for moving said blocking arm and its abutment into engagement with said blocking surface and for finally tiltably positioning said tilt bridge.

4,008,795

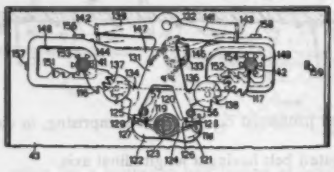
REMOVABLE CARTRIDGE FOR THE INKED RIBBON FOR TYPEWRITERS, CALCULATING MACHINES OR OTHER OFFICE MACHINES

Sergio Garberi, and Lorenzo Bertino, both of Ivrea (Turin), Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Ivrin), Italy

Division of Ser. No. 299,379, Oct. 20, 1972, Pat. No. 3,889,795. This application June 4, 1975, Ser. No. 583,693
Int. Cl.² B41J 33/512
U.S. Cl. 197—161 8 Claims

1. A ribbon feed mechanism for an inked ribbon for a print-

ing machine comprising: two spools carrying said ribbon, a pair of sensing elements for sensing the amount of said ribbon on said spools, a feed element, a reversal member positionable in a first and a second position, means supported by said reversal member and driven by said feed element to drive said ribbon spools in one direction and in the opposite direction according to said first and said second position of said reversal member, respectively, a reversal spring having one end connected to said reversal member and the other end positionable between a first location and a second location, said reversal spring biasing said reversal member from said first position towards said second position in said first location of said other end and from said second position towards said first position in said second location of said other end, two latches, each said latch positionable between an engaging position and a



releasing position for restraining and releasing respectively said reversal member in said first and second positions thereof against the action of said reversal spring, means connecting each of said latches with one of said sensing elements for moving said latches from said engaging position to said releasing position in order to disengage said reversal member therefrom when the ribbon on the corresponding spool has reached a quantity such as to require reversal of the ribbon feed, whereby said reversal spring moves said reversal member from said first position to said second position and vice-versa, and a reload element responsive to said movement of said reversal member, said reload element driven by said feed element for repositioning said other end of said reversal spring from said first location to said second location, and vice-versa, to respectively bias said reversal member from said second position to said first position, and vice-versa.

4,008,796

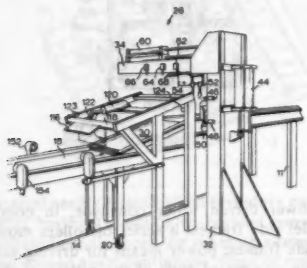
CONTROL METHOD FOR FEEDING ITEMS ON A CONVEYOR

Norman N. Aylon, Willowdale, Canada, assignor to General Concrete of Canada Limited, Hamilton, Canada

Division of Ser. No. 454,792, March 26, 1974, Pat. No. 3,928,114. This application Dec. 3, 1975, Ser. No. 637,199

Int. Cl.² B65G *47/26*

U.S. Cl. 198—460 **1 Claim**



1. In a conveying system comprising a first longitudinally extending conveyor means having a conveying surface for conveying items longitudinally of said first conveyor means and a discharge end, said first conveyor means having a substantially fixed position, said first conveyor means also having an openable gate means at said discharge end for controlling the discharge of items from said first conveyor means; a second longitudinally extending conveyor means having a conveying surface for conveying items longitudinally of said second conveyor means and a discharge end and being situated adjacent said first conveyor means to receive items from said discharge end of said first conveyor means, said second conveyor means being mounted for reciprocal movement longitudinally thereof and longitudinally of said first conveyor means to provide a variable portion of said second conveyor means vertically below said first conveyor means; and first and second item sensing means located in longitudinally spaced relation adjacent said second conveyor means in fixed position relative to said first conveyor means spaced from and downstream of said discharge end of said first conveyor means with said first item sensing means being spaced a distance from said discharge end of said first conveyor means which is greater than said second item sensing means;

a control method for controlling the feed of items from said discharge end of said first conveyor means onto the conveying surface of said second conveyor means during longitudinal movement of said second conveyor means relative to said first conveyor means comprising

feeding items from said discharge end of said first conveyor means onto said conveying surface of said second conveyor means by selective actuation of said gate means while said latter conveying surface is in motion to convey said fed items towards the discharge end of said second conveyor means whereby a plurality of items are situated in longitudinally spaced-apart relation on said conveying surface of said second conveyor means,

sensing a first item fed from said discharge end of said first conveyor means and located on said conveying surface of said second conveyor means by said first sensing means, and opening said gate means in response to said sensing to allow another of said items to pass from said discharge end of said first conveyor means onto said conveying surface of said second conveyor means; said

sensing said another of said items located on said conveying surface of said second conveyor means by said second sensing means, and closing said gate means in response to said latter sensing, whereby said selective actuation of said gate means is achieved and said feed of items from said discharge end of said first conveyor means onto said conveying surface of said second conveyor means is controlled in response to said longitudinal movement of said second conveyor means to maintain said items spaced apart substantially the same distance on said conveying surface of said second conveyor means irrespective of the relative longitudinal positions of the discharge ends of said first and second conveyor means and the portion of said second conveyor means located vertically below said first conveyor means.

4,008,797

MINING MACHINE CONVEYOR WITH DEFLECTIBLE BOOM

Robert C. Nelson, Bluefield, W. Va., assignor to West Virginia Armature Co., Inc., Bluefield, W. Va.

Filed Aug. 14, 1975, Ser. No. 604,558

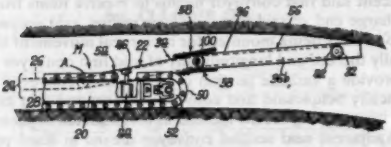
Int. Cl.² B65G *21/12*

U.S. Cl. 198—318 **6 Claims**

1. In a mobile mining machine, a frame, an endless conveyor element trained for orbital movement along a boom extending from one end of said frame, a main pivotal connection between said frame and said boom and means for tiltably adjusting the height of said boom about said main pivoted connection, the improvement comprising:

said boom comprising a main section connected to said frame by said main pivoted connection, and an end section connected to said main section by a supplemental pivoted connection;

spring means carried by said boom at said supplemental pivoted connection biasing said end section toward a normal working position aligned with said main section but enabling vertical tilting movement of said end section to a raised or lowered non-aligned position relative to said



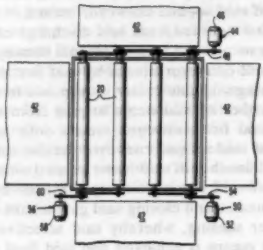
main section in response to an abnormal vertical force against said end section sufficient to overcome the bias of said spring means, said spring means being effective to tiltably return said end section upwardly or downwardly to said normal working positions aligned with said main section upon release of said abnormal vertical force.

4,008,798

TURNTABLE

Bert Krivec, Waukesha, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Sept. 12, 1975, Ser. No. 612,961
Int. Cl.² B65G 47/24, 13/02
U.S. Cl. 198—411 **4 Claims**



1. A turntable comprising:

a. a plurality of transfer roller assemblies mounted in planar array, each of said transfer roller assemblies comprising:

i. a hollow cylindrical roller having a plurality of spaced apertures in the surface thereof and

ii. a plurality of stub rollers mounted in said hollow cylindrical roller such that their axes of rotation are not parallel to the axis of rotation of said hollow cylindrical roller and a portion of the surface of each of said stub rollers protrudes through a corresponding one of said plurality of spaced apertures in said hollow cylindrical roller;

b. first means for rotating said hollow cylindrical rollers in a first subset of adjacent ones of said transfer roller assemblies in a selected direction;

c. second means for rotating said hollow cylindrical rollers in a second subset of adjacent ones of said transfer roller assemblies in a selected direction;

d. third means for rotating said stub rollers in said first subset of said transfer roller assemblies in a selected direction;

e. fourth means for rotating said stub rollers in said second subset of said transfer roller assemblies in a selected direction; and

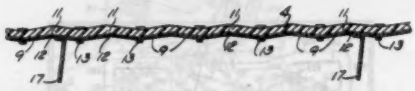
f. fifth means for controlling said first, second, third, and fourth means so that the direction in which said third means causes the stub rollers in said first subset of said transfer roller assemblies to rotate is independent of the direction in which said fourth means causes the stub rollers in said second subset of said transfer roller assemblies to rotate and so that an object positioned upon said plurality of transfer roller assemblies can be caused to rotate and/or translate with respect to said plurality of transfer roller assemblies.

4,008,799

CONVEYOR BELT WEAR PROTECTION

William T. Barrett, Waukesha, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Sept. 8, 1975, Ser. No. 611,495
Int. Cl.² B65G 15/42
U.S. Cl. 198—698 **2 Claims**



1. A wear protected coveyor belt comprising, in combination,

an elongated belt having a longitudinal axis,

a plurality of plates,

means connecting said plates to a surface of said belt with said plates aligned longitudinally on and covering a generally continuous length of said belt,

said plates being spaced inwardly from the longitudinal edges of said belt so that said plates cover the central area of said belt and leave an area of said belt adjacent the longitudinal edges thereof exposed,

said plates also having a bowed configuration in a plane generally normal to said belt surface and parallel to said longitudinal belt axis and said plates having opposite plate edges,

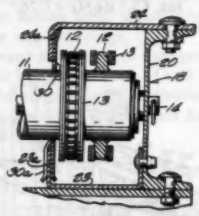
and means defining a cleat attached to a plurality of said plates at points spaced along said longitudinal axis, said cleats projecting laterally from said plates and relative to said belt and also extending generally normal to said longitudinal axis.

4,008,800

CHAIN DRIVEN ROLLER CONVEYOR WITH CLOSURE PLATES

Emil John Forsyth, Danville, Ky., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 26, 1975, Ser. No. 635,565
Int. Cl.² B65G 13/11
U.S. Cl. 198—782 **8 Claims**



1. In a power driven roller conveyor, in combination, spaced parallel side frames; a series of rollers mounted between said side frames; power means for driving said rollers disposed along one set of ends of the rollers; a plurality of spaced support means associated with said side frames for receiving and supporting the axles of said rollers, said support means spaced a distance S apart along the side frames; spaced members projecting from one of said side frames over and below said drive means and the one set of ends of the rollers;

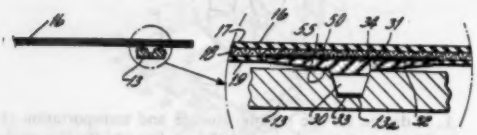
and a plurality of removable abutting plates positioned against the ends of said spaced members and enclosing the drive means, at least a portion of the abutting plates having holes through which the rollers may extend, the width of said abutting plates being a multiple of S thereby permitting changes in the center-to-center spacing of the roller in multiples of S.

4,008,801

GUIDE FOR CONVEYOR BELT

James E. Reilly, Bromley; Frank A. Klaene, and Michael E. Dunn, both of Fort Mitchell, all of Ky., assignors to F. N. Shepard & Company, Cincinnati, Ohio

Filed June 19, 1975, Ser. No. 588,521
Int. Cl.² B65G 15/46
U.S. Cl. 198—841 13 Claims



1. A guide for a conveyor belt having at least one outer surface, said guide comprising

an elongated rib,

an elongated base web integral with said rib and having a width greater than said rib, said rib extending outwardly from said base,

said base web having a first thickness near its juncture with said rib and a thinner second thickness near its respective edges, and

an elongated fabric backing secured to a side of said base web opposite said rib,

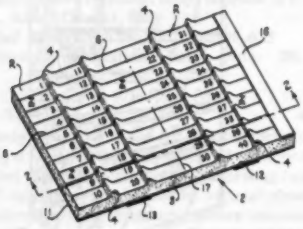
said guide being attached to said conveyor belt, edges of said guide lying in the plane of said conveyor belt's outer surface, and said base web, at its juncture with said rib, lying outwardly of the plane of said outer surface to provide a predetermined wear area adjacent said rib.

4,008,802

SURGICAL NEEDLE RETAINING AND INVENTORY PAD, AND ACCOUNTING METHOD

Samuel L. Freitag, Oakland, Calif., assignor to Acura-Med, San Leandro, Calif.

Filed May 19, 1975, Ser. No. 578,714
Int. Cl.² A61L 17/02
U.S. Cl. 206—63.3 5 Claims



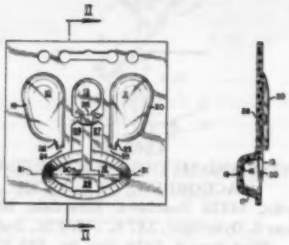
1. A surgical needle retaining and inventory pad comprising a base sheet having at least three parallel rows of consecutively numbered needle receiving zones on a face thereof, and at least two spaced apart continuous ridges of resilient flexible material projecting upright from said face adjacent each zone into which a surgical needle can be inserted and retained, said ridges being integral with said base sheet and parallel to each other, the consecutively numbered zones being defined by the ridges and by lines on said face of the base sheet extending transversely with respect to said ridges, said base sheet being permanently bonded to a relatively stiff backing sheet which has a line of weakness along which the pad can be folded.

4,008,803

PACKAGE FOR TWO REACTIVE INGREDIENTS OF A DESIRED MIX IN A SINGLE PACK

F. Charles Smith, 9 Glenview Road, Strathmore, Victoria, Australia (3041)

Filed Nov. 7, 1973, Ser. No. 413,578
Claims priority, application Australia, Nov. 8, 1972, 1150/72
Int. Cl.² B65D 25/08
U.S. Cl. 206—220 1 Claim



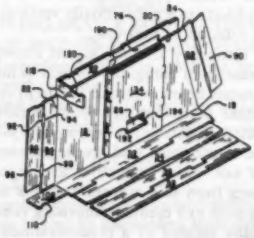
1. A package comprising two strips of thermo-plastic material sealed in face-to-face relation, one of said strips having two cut-out apertures in its central portion separated by a band integral with the material of said strip and a preformed cavity projecting downwardly from the plane of the strip adjacent one of the apertures, said strip also having a preformed sac projecting upwardly from the plane of the strip on each side of said central portion, a quantity of resin in one of said sacs and a quantity of hardener in the other of said sacs, said second strip having a preformed cavity projecting downwardly and mating with said first cavity to form a mixing bowl, each said sac having a projection adjacent said mixing bowl, a flat spatula extending along said cut-out apertures, said spatula underlying said band and overlying said bowl and having a sharpened point for rupturing said projections to permit extrusion of the contents of said sacs into said mixing bowl.

4,008,804

BATHTUB CONTAINER AND METHOD

Lewis D. Poggiali, Owosso, Mich., assignor to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 428,800, Dec. 27, 1973, Pat. No. 3,957,158. This application Oct. 9, 1975, Ser. No. 621,101
Int. Cl.² B65D 85/30, 85/64
U.S. Cl. 206—320 2 Claims



1. A two-piece paperboard end cap for a wrap-around bathtub package, the combination comprising

a. a four sided planar member having top and bottom edges and front and rear side edges,

b. a plurality of cushion members, one for each of said edges, with each cushion member formed with at least a pair of roll-up members that are perpendicularly disposed to said planar member at its corresponding edge,

c. a support member position in juxtaposition to said planar member and between said cushion members,

d. the cushion member at said top edge having a recess in one of said roll-up members receiving an end of said support member whereby the end of said support member is disposed adjacent the other of said roll-up members, and

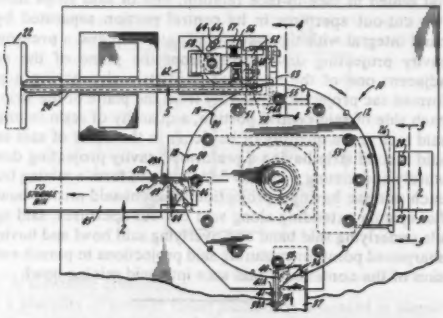
e. fixing means operatively connecting said planar member and said support member whereby said support member is fixedly attached to said planar member.

4,008,805

APPARATUS AND METHOD FOR SORTING OBJECTS ACCORDING TO LENGTH

Paul Goerke, 14126 Dearborn, Riverdale, Ill. 60627, and Waldemar S. Dyhringer, 257 E. 143rd St., Dolton, Ill. 60619

Filed June 9, 1975, Ser. No. 585,357
Int. Cl.² B07C 1/10
U.S. Cl. 209—73 **13 Claims**



1. A apparatus to segregate elongated objects according to length comprising:

a rotatable disc;

object inlet means located adjacent to the periphery of said disc to supply elongated objects to said disc;

at least one magnetic means at or near the periphery of said disc so that, as said disc rotates, said magnetic means picks up and hold at least one elongated object from said object inlet means, said magnetic means holding said elongated objects in a substantially vertical position relative to the rotation of said disc;

substantially stationary leveling means located below said disc to contact said elongated objects being held by said magnetic means below said disc and to provide a substantially constant predetermined length below said disc of said elongated objects being held by said magnetic means as said disc rotates past said leveling means; and

a plurality of exit means to remove and recover said elongated objects from said magnetic means as said disc rotates, each such exit means comprising removal means at least partially located at a predetermined height above said disc for removing said elongated objects from said magnetic means and a collection means for storing said elongated objects thus removed, provided that the predetermined height above said disc of each succeeding removal means decreases.

4,008,806

SORTER FOR YARN-LIKE MATERIALS

Consuelo R. de Páez, and Stephen A. Páez, both of Pittsburg, Calif., assignors to Consuelo R. de Páez, Pittsburg, Calif.

Filed Dec. 16, 1974, Ser. No. 533,023
Int. Cl.² B07C 7/00
U.S. Cl. 209—122 **10 Claims**

1. A device for the sorting, storage and transportation of yarn-like material, such as cord, thread, line and the like, tools and other paraphernalia comprising:

a. a bag containing a plurality of elongated yarn-like material skeins including means for holding the skeins, said holding means mounted about the skeins intermediate the ends thereof for fixedly securing the same against a portion of the interior of said bag, said holding means permitting access to and relative movement of the free ends of the skeins,

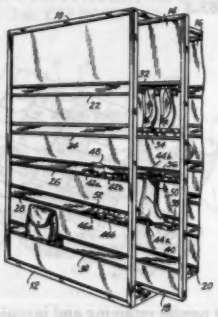
b. means for sorting the free ends of said yarn-like material including a sorting member disposed in a portion of the body of said bag and having a plurality of openings for separating and guiding the free ends of the skeins from the interior to the exterior of said bag, the skeins being readily available to the user.

4,008,807

DISPLAY DEVICE PARTICULARLY SUITABLE FOR SHOES

Geoff Phillips, 2 W. 45th St., New York, N.Y. 10036

Continuation-in-part of Ser. No. 553,172, Feb. 26, 1975, abandoned. This application June 2, 1975, Ser. No. 582,701
Int. Cl.² A47F 7/08
U.S. Cl. 211—34 **13 Claims**



1. An article display comprising cooperating article support sections adapted for supporting an article there-between and means for holding said sections in adjustably spaced relation, said means including two arrays of horizontal guides arranged in parallel horizontal planes and a panel wedged between said arrays, said sections being adjustably located in said guides, each of said sections including a flange adapted to ride in one

of said guides, a base extending horizontally from said flange and lateral and front lips on said base to define a box-like structure therewith.

4,008,808

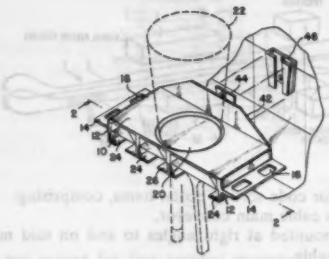
RAZOR SAFETY RACK

Jack D. Ramsay, Duluth, Minn., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Dec. 29, 1975, Ser. No. 644,738

Int. Cl.² A47B *81/02*; A47F *5/08*

U.S. Cl. 211—65 **3 Claims**



1. A holder for a plurality of safety razors and other bathroom articles comprising:

a horizontally elongated housing having a plurality of recesses underneath a shelf, some of said recesses receiving safety razors of the double-edge type and at least one recess receiving razors of single-edge type;

two horizontal, opposed flanges, each flange being located on a corresponding end of the shelf and bearing a plurality of holes through which toothbrush handles may be placed;

a spring-loaded plate located in the said one recess for receiving single edged razors;

catch means located in the said some recesses for pressing against the head of double edge razors placed therein to retain the razors removably in the recesses and thereby prevent them from being accidently dislodged therefrom; and

mounting means detachable securing the housing to a vertical wall.

4,008,809

COLUMN-TYPE DISPLAY STAND FOR FLAT PARALLELIPIPEDIC ARTICLES

Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy

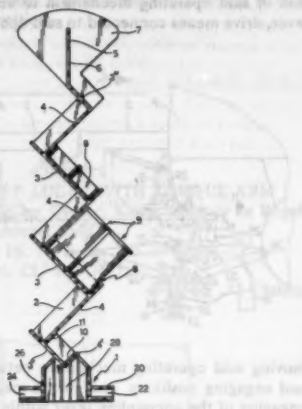
Filed July 14, 1975, Ser. No. 595,635

Claims priority, application Italy, Nov. 20, 1974, 53612/74[U]

Int. Cl.² A47F *5/04*, *7/03*

U.S. Cl. 211—71 **4 Claims**

1. A column-type display stand for flat parallelipiped articles comprising a lower supporting base and an upper display column mounted thereon, said column comprising two lateral zig-zag shaped sides disposed in parallel vertical planes and a plurality of interconnected transverse plates connected between the two sides and being alternately inclined in opposite directions so as to define with said sides a plurality of rectangular chambers alternately inclined in opposite directions and rib means on the plates defining at least one of said chambers to define the spaces for the articles, said chamber having said rib means being located adjacent to the lower supporting base and having dimensions smaller than the other chambers in said column and container means having external dimensions substantially identical to the internal dimensions of said other chambers and adapted to fit snugly therein, said container means including two elongated compartments extending in side by side relation for holding two parallel rows of articles



and rib means on the longer walls of each elongated compartment to define the spaces for the articles.

4,008,810

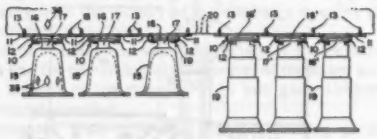
EQUIPMENT FOR MIXING SHAKEN DRINKS

William James Merz, 220 W. Rittenhouse Square, Philadelphia, Pa. 19103

Division of Ser. No. 527,630, Nov. 27, 1974, Pat. No. 3,985,346. This application Oct. 15, 1975, Ser. No. 622,632

Int. Cl.² A47G *29/00*

U.S. Cl. 211—71 **3 Claims**



1. An array of bar accessories for use in preparing shaken drinks, comprising a shaker shell having a pedestal with a base flange connected to the shell by a neck portion having two parallel sides, a plurality of slide racks each comprising a hanger rail of C-section adapted to be mounted on the underside of a bar, and each having mounting means along its lengths, said racks receiving and supporting the shell flanges, said shaker shell having an oval lip at its open end and said necks cooperating with said racks to maintain their parallel sides parallel to the long axis of the oval lips of said shells.

4,008,811

UNCOUPLING DEVICE FOR CENTRAL BUFFER COUPLINGS ON RAILROAD VEHICLES

Kuno Nell, Zorneding, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed June 18, 1975, Ser. No. 587,865

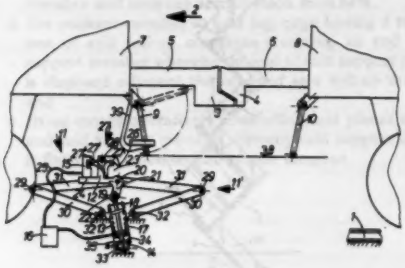
Claims priority, application Germany, June 19, 1974, 2429365

Int. Cl.² B61G *7/04*

U.S. Cl. 213—211 **12 Claims**

1. An uncoupling device for a central buffer coupling on a railroad vehicle having an uncoupling lever pivotable about a horizontal axis transverse to the longitudinal axis of the vehicle, and comprising an operating mechanism adjacent the rails upon which the railroad vehicle is positioned and having one portion thereof pivotally mounted about a horizontal axis transverse to the longitudinal axis of the vehicle and movable

between an inoperative position and an uncoupling lever engaging position, a hook pivotally mounted on another portion of said operating mechanism to engage the uncoupling lever, drive means connected to said operating mechanism for



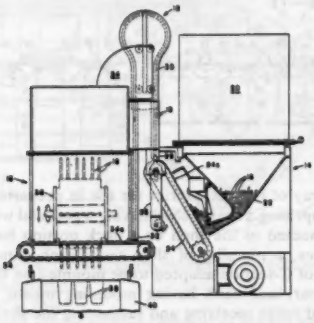
moving said operating mechanism between said inoperative and engaging positions, and switch means responsive to the engaging of the uncoupling lever within said hook for initiating movement of said operating mechanism from the engaging position to an uncoupling position.

4,008,812

STICK STORAGE APPARATUS WITH AUTOMATIC REJECT SYSTEM FOR MISALIGNED STICKS

Meredith Stuart, Rogers, Ark., assignor to Forster Mfg. Co., Inc., Wilton, Maine

Filed Sept. 15, 1975, Ser. No. 613,353
Int. Cl.² B65G *37/30*
U.S. Cl. 214—6 BA **9 Claims**



1. Apparatus for storing flat, elongated sticks in an aligned, face-to-face relationship, comprising, in combination,

a guideway having a first substantially vertical section with a stick input formed at its lower end, a second substantially vertical section with a stick output formed at its lower end, and a curved upper section connecting the upper ends of said vertical sections, each of said guideway sections being spaced from the ends and side edges of said sticks a sufficient distance to maintain said aligned face-to-face relationship while allowing said sticks to advance within said guideway from said input means to said output means in a direction generally normal to the face of each of said sticks,

said upper section being movable vertically with respect to said first and second sections to store a varying number of sticks in said guideway while maintaining a substantially constant inter-stick pressure,

means for retaining said sticks in said first vertical section against the influence of gravity, and

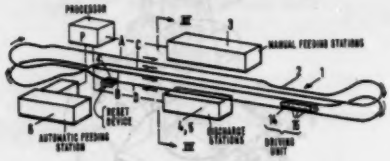
means for sensing the approximate number of sticks stored in said guideway.

4,008,813

CONVEYING DEVICE FOR CODE SORTING POSTAL ITEMS

Carolus Pieter Leersnijder, Heemstede, Netherlands, assignor to Staat der Nederlanden, Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Feb. 6, 1975, Ser. No. 547,389
Claims priority, application Netherlands, Feb. 8, 1974, 7401774
Int. Cl.² B65G *43/00*
U.S. Cl. 214—11 R **5 Claims**



1. A device for code sorting postal items, comprising:

A. an endless cable main conveyor,

B. carriers mounted at right angles to and on said main conveyor cable,

C. rails along said main conveyor for guiding said carriers,

D. at least one means for engaging said carriers for driving said cable,

E. a plurality of cassettes having wide top edges for cooperating with and being removably mounted in said carriers, said cassettes being mounted at right angles to the direction of movement of said main conveyor, and each cassette being capable of transporting one postal item in an upright position,

F. at least one feeding station along said main conveyor where postal items are fed to said cassettes,

G. means at said feeding station for transferring and recording in a processor coded information relative to the destination of said postal items,

H. a plurality of discharged positions along said main conveyor into which postal items are discharged from said cassettes in accordance with the coded information recorded in said processor,

I. endless belt means coupled to said main conveyor for removing cassettes from said main conveyor before they pass said feeding station, said endless belt means having catches engageable with an empty cassette for withdrawing it from said main conveyor, and

J. a second belt conveyor also coupled to said main conveyor and running parallel to it at the same speed of said main conveyor for supporting a removed cassette and moving it toward said feeding station.

4,008,814

CRANE WITH A GRIPPING DEVICE FOR HANDLING SLABS

Leopold Kral, Am Flutgraben 64, 5000 Cologne 80; Klaus-Gunter Finke, Birkenweg 16, 4019 Monheim, and Theo Webers, Friedrich-List-Str. 5, 403 Ratingen, all of Germany

Filed Jan. 31, 1975, Ser. No. 545,979
Claims priority, application Germany, Feb. 6, 1974, 2405601
Int. Cl.² B65G *47/00*
U.S. Cl. 214—16 B **7 Claims**

1. A gripping device for handling slabs to be deposited side by side in storage means, the device comprising:

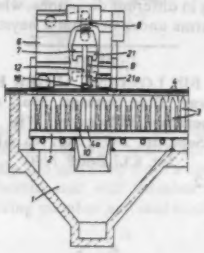
a. a mobile crane at least part of which is disposed over the storage means and which is displaceable in a direction transverse to slabs stored therein;

b. a bridge structure vertically displaceable relative to said mobile crane;

c. at least two gripper means carried by said bridge structure and disposed at spaced locations with respect to the stored slabs, both gripper means being disposed in a plane substantially parallel to the planes of the slabs;

d. each gripper means including a vertical support rod which can be lowered into the storage means, each vertical support rod having at least one controllable load support member at the lower end thereof for selectively engaging under or releasing the slabs;

e. vertical guide rod means coupled with said bridge structure and profiled holder means mounted on said guide



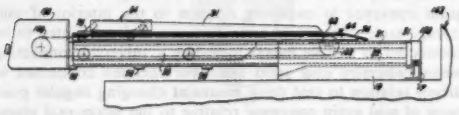
rod means for free vertical movement relative to said bridge structure between a low end position defined by an abutment on said guide rod and a high end position defined by the height of the slab being handled, the storage means including a plurality of compartments for holding slabs in generally parallel array, the profiled holder means being of such dimension as to extend transversely over two adjacent compartments whereby said holder means prevents tilting of the slabs when supported by said gripper means and whereby, upon lowering of said bridge structure, said profiled holder means engages an upper end of the slabs to be handled.

4,008,815

REACTOR LOADING APPARATUS

Robert Walter Fisk, Sunnyvale, Calif., assignor to Applied Materials, Inc., Palo Alto, Calif.

Filed Apr. 14, 1975, Ser. No. 567,634
Int. Cl.² B65G *49/00*
U.S. Cl. 214—17 C **13 Claims**



1. In apparatus for transporting an object into or out of a chamber having an opening of limited height through which the object can pass:

A. a base mounted in a predetermined position outside the chamber;

B. an axially elongated framework mounted on the base generally in alignment with the opening in the chamber;

C. a first carriage mounted on the framework and movable between advanced and retracted axial positions;

D. a second carriage mounted on the first carriage and movable axially between advanced and retracted positions relative to the first carriage for receiving the object and carrying the same between a position outside the chamber in which the first and second carriages are both in their retracted positions and a position inside the chamber in which both carriages are in their advanced position; and

E. an axially extending fork assembly mounted on the second carriage for engaging the object to carry the same;

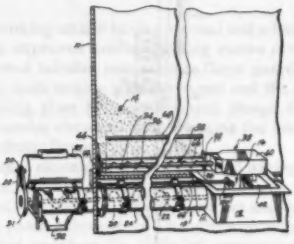
F. the framework being pivotally mounted to the base to permit movement of the fork assembly between raised and lowered positions when the second carriage is in a predetermined position.

4,008,816

GRAIN BIN SWEEP AUGER WITH TORQUE ARM

Leonard E. Harrison, Clay Center, Kans., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed May 16, 1975, Ser. No. 578,271
Int. Cl.² B65G *65/30*
U.S. Cl. 214—17 DA **12 Claims**



1. In a grain storage bin having a floor with a central grain discharge opening in it, apparatus for unloading grain from the bin comprising:

an elongated sweep auger located in the bin and extending radially from the vicinity of the discharge opening to the outer wall of the bin;

means for rotating the sweep auger about its longitudinal axis and for permitting angular travel of the auger around the interior of the storage bin to pull grain toward the discharge opening;

an elongated grain-deflecting shield extending generally parallel to the auger along substantially the entire length thereof;

means for attaching the shield in a fixed position spaced closely from the auger on the side thereof remote from the direction of angular travel of the auger, the shield being mounted so that a generally concavely curved face of the shield faces toward the auger so the shield cooperates with the auger during use to channel grain toward the discharge opening during axial rotation of the auger, said shield attachment means including a pair of rigid support bracket means spaced apart along the length of the auger;

a rigid, elongated stiffening member extending along a side of the shield opposite the auger;

means for attaching the stiffening member in a fixed position spaced closely from the shield along a substantial portion of the length thereof to stiffen the shield longitudinally and torsionally and to stiffen the auger longitudinally, said stiffening member attachment means including a pair of rigid support bracket means for rigidly affixing the opposite end portions of the stiffening member in said fixed position and for engaging the opposite end portions of the shield, and means for rigidly attaching the stiffening member support bracket means and the opposite end portions of the shield to the shield support bracket means; and

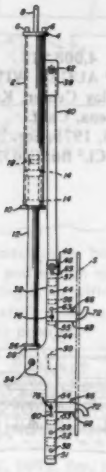
means for releasably attaching the stiffening member and the shield to the shield support bracket means to permit adjusting the vertical elevation of the shield and stiffening member above the bin floor relative to the position of the sweep auger.

4,008,817

SAW BLADE HANDLING DEVICE

Robert L. Johnson, Calumet City, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1972, Ser. No. 227,477
Int. Cl.² B66C 1/00
U.S. Cl. 214—147 R **6 Claims**



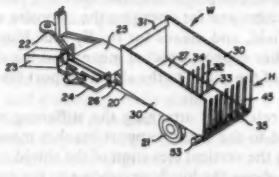
1. A handling device for a saw blade and the like having a pair of diametrically opposed holes therein, said device comprising a vertical cylinder, lifting means at the top of said cylinder, a lifting rod slidably mounted in said cylinder with its lower end extending below the bottom of said cylinder, a saw blade support, means pivotally connecting said support intermediate its length to the lower end of said rod for movement between horizontal and vertical positions, and a link having its upper end pivotally mounted on the outside of said cylinder and its lower end pivotally connected to the upper end of said saw blade support, said saw blade support having a pair of lugs extending generally normal therefrom one on each side of the pivot connection to said rod and adapted to engage in said diametrically opposed holes in the saw blade, including means for selectively mounting said lugs on said support various distances from the pivot connection to said rod, said lifting rod being movable between upper and lower positions, means limiting downward movement of said rod, and means for locking said rod in its upper position with said saw blade support being in its horizontal position.

4,008,818

HAYSTACKING AND RELOADING TAILGATE APPARATUS

Allan B. Neely, Jr., 12991 E. Nevada, Aurora, Colo. 80012

Continuation-in-part of Ser. No. 275,479, July 7, 1972. This application Apr. 11, 1975, Ser. No. 567,139
Int. Cl.² B60P 1/28
U.S. Cl. 214—505 **7 Claims**



1. A haystack loading and unloading apparatus adapted to be mounted at the end of a hay wagon or the like, to load and unload an upstanding stack of hay bales thereon and therefrom, and comprising, in combination therewith:

a. a transverse, horizontally disposed array of longitudinally extended arms in spaced parallelism and cantilevered from the hay wagon to support the stack of hay bales;

b. means to support the arms with the stack of hay bales thereon including a transverse array of longitudinally axised sleeves carried on the wagon with the base portion of each arm being slidably fitted into a sleeve and with the arm being cantilevered therefrom; and

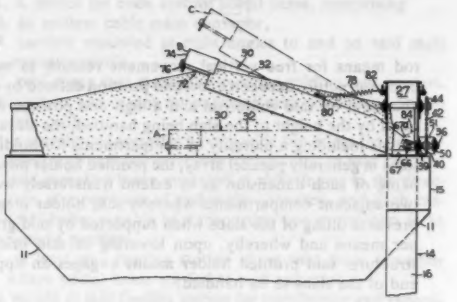
c. means at the base of the arms to longitudinally reciprocate the arms within the sleeves, with adjacent arms reciprocating in different directions, whereby to facilitate moving the arms under or from a haystack.

4,008,819

SELF-RAISING BIN LOADING AUGER FOR COMBINES

Roger D. Hanaway, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 26, 1975, Ser. No. 617,097
Int. Cl.² B60P 1/40
U.S. Cl. 214—522 **12 Claims**



1. In combination, a grain storage tank means adapted to be mounted on an agricultural combine, an elevating conveyor adapted to deliver grain to an upper portion of said storage tank means, a grain conveyor positioned contiguous but beneath the upper end of said storage tank means, said grain conveyor being adapted to receive grain discharged by said elevating conveyor and to convey grain thus received to a substantially downwardly directed discharge outlet of said grain conveyor in overlying relation to the interior of said storage tank means, said grain conveyor being adapted to be connected to a drive means including a universal connecting means whereby said grain conveyor remains connected in driven relation to said drive means at changing angular positions of said grain conveyor relative to the horizontal plane, support means supporting said grain conveyor for pivotal movement about a horizontal axis coincident with the center of said universal connecting means whereby at least the discharge end of said grain conveyor rides on the upper surface of the loaded grain in said storage tank means when the level of grain in said storage tank means exceeds a predetermined level, and means defining a path excluding said universal connecting means for passage of grain from contiguous the upper end of said elevating conveyor to the intake of said grain conveyor.

4,008,820

PLASTICS MATERIAL CLOSURE MEMBER FOR A CONTAINER

Joseph Ruetz, Jurastrasse 41, 2502 Biel, Switzerland

Filed Dec. 10, 1975, Ser. No. 639,415
Claims priority, application Switzerland, Dec. 16, 1974, 16725/74
Int. Cl.² B65D 41/18
U.S. Cl. 215—256 **10 Claims**

1. A closure member made of plastic material for a con-

tainer, said closure member comprising a gripping portion and a hollow, substantially cylindrical sealing portion open at its upper end, said gripping portion having a depending container engaging wall member, said sealing portion being disposed adjacent said gripping portion and including a sealing wall and a centering member closing the lower end of said sealing

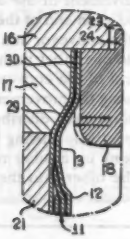
portion, said centering member having a side wall offset from and parallel to said sealing wall, and a curved bottom wall extending outwardly and upwardly from a center point to said side wall, and wherein said wall member of said gripping portion, said centering member and said sealing wall are laterally deformable.

4,008,821

NECKED-IN CAN BODY AND APPARATUS FOR MAKING SAME

George W. Thompson, Orland Park, and John T. Hilgenbrink, Oak Lawn, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 77,617, Oct. 2, 1970, Pat. No. 3,690,279. This application Aug. 3, 1972, Ser. No. 277,609
Int. Cl.² B65D 7/42
U.S. Cl. 220—67 8 Claims



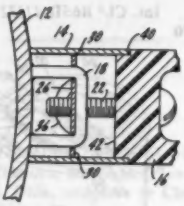
5. A substantially tubular metal can body comprising a substantially cylindrical central section and at least one necked-in terminal section, said necked-in terminal section having an annular portion providing an abrupt and substantial reduction in diameter of said tubular can body, said tubular can body further including a side seam extending along said tubular body including said necked-in section, said side seam including a soldered interlocking portion extending along said cylindrical central section and at least one lap portion extending throughout said at least one necked-in terminal section and into said cylindrical central section, said necked-in terminal section being of an external diameter substantially less than the external diameter of said cylindrical central section whereby a can end double seamed to said necked-in terminal section including the normal protruding double seam will be recessed within an axial projection of said cylindrical central section, said lap portion extending along the surface of said annular portion so as to extend substantially radially and axially beyond said necked-in terminal section.

4,008,822

NON-ROTATABLE FLAME GUARD ASSEMBLY

William Michael Carroll, Milwaukee, Wis., assignor to Koller Die & Tool Company, Milwaukee, Wis.

Filed Nov. 24, 1975, Ser. No. 634,495
Int. Cl.² B65D 25/28
U.S. Cl. 220—94 R 7 Claims



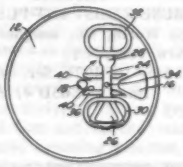
1. In a cooking utensil having a vessel and a handle attached thereto, an improved interconnecting means comprising:
a. a tapered tubular, non-annular flame guard having contoured ends mating with the vessel and the handle;
b. a locking plate having a stamped thread therein and a non-annular circumference engaging the interior walls of said tubular flame guard;
c. a bracket mounted on the vessel and having an aperture therein, said bracket having a shape to permit insertion of said locking plate between the bracket and the vessel; and
d. a bolt passing through said handle, said tubular member, and said aperture for threaded engagement with said stamped thread.

4,008,823

CONTAINER WITH ATTACHED PULL TAB OPENER

Richard E. Tarro, 425 Broadway, Providence, R.I. 02914

Filed Aug. 11, 1975, Ser. No. 603,590
Int. Cl.² B65D 41/32
U.S. Cl. 220—269 10 Claims

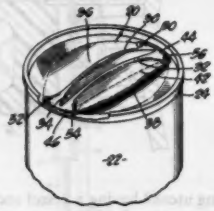


1. A pull tab opener device for a container having a metal top comprising a scored portion outlining the opening, said scored portion being of a generally oval shape aligning axially with a radius of the top, said scored portion having an enlarged end adjacent the outer perimeter of the top and a small end at the inner end, a pull tab attached to said scored portion adjacent the outer edge thereof on the enlarged end, said pull tab having a portion bent over the edge of the container to extend below the edge, said bent portion snapping over the edge of the container to releasably retain said tab in open or closed position, and means for pivotally attaching the inner small end of said scored portion to the metal top of the container.

4,008,824
CONTAINER CLOSURE HAVING TEAR-AWAY CONSTRUCTION

Charles Simon Renoux, 14 Rue d'Orchampt, Paris 18eme, France

Filed Apr. 2, 1975, Ser. No. 564,491
Claims priority, application United Kingdom, Apr. 9, 1974, 15693/74
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 8 Claims

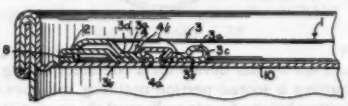


1. A closure for a container comprising: a generally circular metal member having an outer peripheral edge adapted to be secured and sealed around the peripheral opening of a generally cylindrical container; means defining a continuous line of weakness enclosing a portion of the upper surface of said member which extends substantially diametrically across a major portion of said closure; and a pair of substantially parallel, substantially diametrically extending upstanding ridges within said portion of said member which is enclosed by said line of weakness; said upstanding ridges being integrally formed in said member; said upstanding ridges being spaced from one another to define a generally diametrically extending space therebetween; said upstanding ridges being adapted to be squeezed towards one another to tear a portion of said member along a portion of said line of weakness and thereafter, to be pulled to tear the entire portion of said member enclosed by said line of weakness from the remainder of said member to form an opening therein through which the contents of a container to which said member is connected may be removed; and means defining a depressed area in said metal member adjacent the outwardly facing surface of each of said upstanding ridges for accommodating the thumb and forefinger of a user to facilitate squeezing said upstanding ridges toward one another.

4,008,825
ABUSE RESISTANT PULL TAB

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed May 10, 1976, Ser. No. 684,686
Int. Cl.² B65D *41/32*
U.S. Cl. 220—273 8 Claims

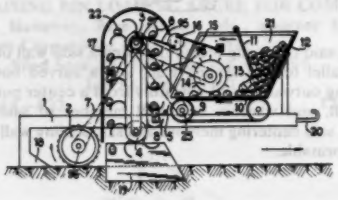


1. An improved thin sheet metal pull tab having fracturing means adapted for fracturing a score line of an end closure, grasping means adapted for grasping and lifting of said pull tab, and attachment means integral with said fracturing means and said grasping means, said attachment means comprising a first panel member and a reinforcing panel member, said first panel member being adapted for attaching said pull tab to the end panel of an end closure, said reinforcing panel member being integrally formed in said pull tab and disposed in backing relation to said first panel member to strengthen and rigidify the same, said grasping means comprising an aperture-defining edge member and said reinforcing panel member being formed of material displaced to form the aperture.

4,008,826
PLANTING MACHINE FOR POTATOES AND OTHER TUBERS

Francis Carrée, Loudeac, France, assignor to Societe Jeantil & Cie, Mordelles, France

Filed Aug. 20, 1975, Ser. No. 606,226
Claims priority, application France, June 25, 1975, 75.19865
Int. Cl.² A01C *9/02*
U.S. Cl. 221—13 14 Claims



1. A planting machine for tubers such as potatoes comprising a hopper for containing tubers to be planted, a movable conveyor which forms a transverse bottom of the hopper and extends outside the hopper and is movable in a given direction, means for driving the conveyor in said given direction, tuber distributing means for receiving the tubers from the conveyor and distributing the tubers one by one to the furrow to be sown, and regulating means for restricting the supply of tubers from the conveyor to the distributing means to solely one tuber at a time, the regulating means comprising a rotary structure mounted above the conveyor and defining with the conveyor a gap which is capable of allowing the passage of only one row of tubers, means for driving the periphery of the rotary structure adjacent the conveyor in a direction opposed to the direction of movement of the conveyor, a fork-shaped collector cup mounted at an end of the conveyor for receiving only one tuber from the conveyor at a time, means responsive to the presence of said one tuber in the cup and operative for stopping the movement of the conveyor when said one tuber is in the cup and allowing the movement of the conveyor when the collector cup is empty, the distributing means comprising movable cups for respectively passing through the fork-shaped collector cup and taking up a tuber received in the collector cup and depositing the tuber into the furrow, and means for driving the movable cups.

4,008,827
CONTAINER FOR VENDING MACHINES

Paul Appelbaum, Roswell, N. Mex., and Cecil J. Rhodes, Mesa, Ariz., assignors to Cartridge Vending Systems, Inc., Roswell, N. Mex.

Filed Dec. 3, 1975, Ser. No. 637,109
Int. Cl.² B65H *1/00*
U.S. Cl. 221—197 10 Claims

1. An electro-mechanical interlock for a cartridge insertable into a vending machine and adapted to enclose vended articles for dispensing from said vending machine, said interlock comprising:

door means connected to said cartridge container for pivotal movement between open and closed positions to control the removal of said articles from said container, said door means including latch means attached thereto for pivotal movement therewith;

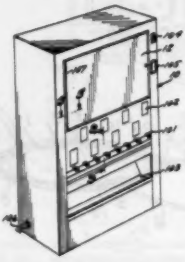
electrical terminal means mounted in said vending machine for providing a source of electrical power;

electrical contact means mounted on said container for

contacting said terminal means upon insertion of said container into said vending machine;

a first spring attached to said container and engaging said latch means when said door means is in said closed position to maintain said door means in said closed position;

a second spring attached to said container and normally located out of engagement with said latch means, said second spring being adapted to be urged into engagement with when said door means is in said open position to maintain said door means in said open position;



urging means movable into said container, for urging said second spring into said engagement with said latch means, upon insertion of said container into said vending machine; and

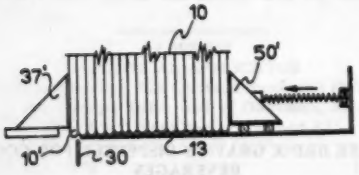
solenoid means connected to said contact means to derive electrical power therefrom and operative for pivoting said door to said open position and for concurrently urging said first spring out of said engagement with said latch means, said solenoid means being operative upon contact between said contact means and said terminal means.

4,008,828

NEWSPAPER VENDING MACHINE

Jean-Marie Branchaud, 3655 Papineau St., Apt. 403, Montreal, Quebec, Canada

Filed Sept. 29, 1975, Ser. No. 617,535
Int. Cl.² B65H *1/02*
U.S. Cl. 221—241 **9 Claims**



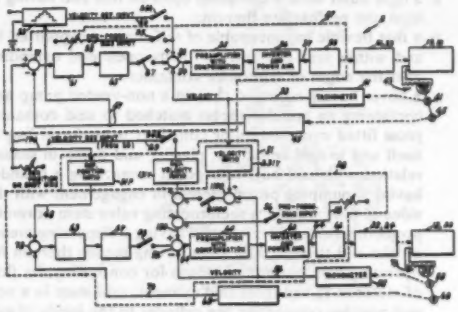
1. In a newspaper vending machine, the combination comprising a support for carrying a stack of newspapers resting edgewise thereon, a first and a second movable abutment means arranged to engage the opposite ends of said stack respectively, a separating wedge means displaceable edgewise upwardly into separating position between the one newspaper against said first movable abutment means and the remainder of said stack, an actuating mechanism operatively connected to said separating wedge means and constructed and arranged to displace the latter into said separating position, a handle connected to said actuating mechanism and arranged to actuate the latter and said separating wedge means, and link means connected to said actuating mechanism and to said first movable abutment means and arranged to increase the spacing of the latter from said separating wedge means and to release said one newspaper for access thereto and wherein said actuating mechanism includes a pair of actuating links extending along opposite sides of said stack respectively and rigidly secured to said handle for displacement therewith lengthwise of said stack, a pair of cam levers pivoted about a transverse axis relative to said stack and arranged on opposite sides of the latter respectively, to upwardly engage and displace said wedge means upon operative actuation thereof, and said actuating links are constructed and arranged to engage said cam levers and to operatively pivot the same.

4,008,829

RATIO CONTROLLED MIXING OF LIQUIDS

Rangasami Sarat Chandra, Davenport, Iowa, and Kirby Lee Stone, Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 501,743, Aug. 29, 1974, Pat. No. 3,908,862. This application Aug. 13, 1975, Ser. No. 604,342
Int. Cl.² B67D *5/08*
U.S. Cl. 222—63 **8 Claims**



1. Apparatus for feeding liquids in a preselected ratio from at least two separate sources each havng an automatic control system arranged in a velocity coupled master and slave relationship comprising:

a. first and second positive displacement liquid feed means;

b. first and second means for measuring the velocity at which, respectively, each of said first and second liquid feed means dispenses its respective liquid;

c. first and second velocity feedback control system means, for automatically controlling said first and second liquid feed means, respectively, by feeding back signals from, respectively, said first and second velocity measuring means to a control summing junction means in each respective control system for producing a control signal;

d. velocity ratio control means for receiving an input signal from said first velocity measuring means and in response thereto producing as an output signal a ratioed master velocity signal that has a preselected ratio to its corresponding said input signal; and

e. velocity signal summing means for receiving and summing said ratioed master velocity signal and said slave velocity signal from said second feedback control system means to produce a feedback error signal; and

f. means to conduct said feedback error signal to the aforesaid control summing junction means in said second feedback control system means,

whereby said slave velocity signal is summed twice to produce a slave control signal for controlling the velocity at which said second or slave liquid feed means is operated.

4,008,830

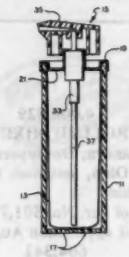
LIQUID DISPENSER USING A NON VENTED PUMP AND A COLLAPSIBLE PLASTIC BAG

Philip Meshberg, 85 Old Oaks Road, Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 387,247, Aug. 10, 1973, abandoned. This application Mar. 20, 1975, Ser. No. 560,301

Int. Cl.² B65D *35/28*

U.S. Cl. 222—95 **10 Claims**



1. A product dispenser which permits dispensing semi-liquid and viscous products without placing the product in a pressurized container comprising:

a. a rigid outer hollow container open on one end having at least one perforation therein;

b. a thin flexible bag incapable of self-support supported by and within said container with its open end extending over the edges of said outer container;

c. a cover having mounted therein a non-vented pump and containing an annular recess matched to said container press fitted over said outer container to seal said bag to itself and to said container, placing said pump in sealing relation with said bag, said pump comprising a cylinder having a pumping piston therein in engagement with the sides of the cylinder, a reciprocating valve stem normally projecting from said cover and having a dispensing means on the end thereof, said stem having means thereon for operating said piston and means for controlling the flow of material to and from said cylinder, said stem in a normal position connecting the cylinder to the inside of said bag, initial movement of the stem inwardly from a normal position closing off the cylinder from the bag and connecting the dispensing means to the cylinder and continual movement of the stem causing the piston to move in the cylinder and force the material therein through the dispensing means, said stem maintaining said cylinder closed off from the inside of said bag until said stem reaches a position which is almost its normal position and

d. a dip tube extending to the bottom of said bag having an uneven end to prevent the bag from stopping the end of said tube and having grooved sides to permit the product to flow along it to the open end without being stopped by the bag collapsing around said tube whereby prior to sealing said bag may be filled with the material to be dispensed and whereby the air pressure admitted through said perforation exerts a pressure on the outer wall of said bag causing the product to fill the pump cylinder each time the pump is operated and the cylinder emptied as said flexible bag is collapsed by said same air pressure.

4,008,831

SAFETY RESERVOIR FOR HYDROCARBONS AND DANGEROUS LIQUIDS

Jacques Vidilles, 24, Boulevard Maillot, 92 Neuilly, France

Continuation of Ser. No. 415,616, Nov. 14, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,424

Claims priority, application France, Nov. 20, 1972, 72.41182

Int. Cl.² B65D *35/28, 35/56*

U.S. Cl. 222—95 **16 Claims**

1. A vehicle fuel tank comprising

an expandable flexible reservoir having two stretchable elastomeric walls which are impermeable to said fuel and are disposed in face to face contact when the reservoir is empty, said walls being bonded together in face to face contact around the peripheral edges thereof in a fluid impermeable seal,

a rigid housing enclosing a chamber having a shape and dimensions corresponding substantially to the shape and dimensions of the said reservoir when expanded by fuel contained therein without stretching of the walls, said

housing being divided into two parts having overlapping peripheral edges which are joined by a means which permits separation of the two parts in response to an impact blow on the housing,

said reservoir being disposed completely in the chamber and substantially unattached to the housing.

4,008,832

THREE DRINK GRAVITY DISPENSER FOR COOL BEVERAGES

Joseph John Rodth, Barkhemstead, Conn., assignor to The Coca-Cola Co., Atlanta, Ga.

Filed Oct. 28, 1975, Ser. No. 626,400

Int. Cl.² B67D *5/56*

U.S. Cl. 222—129.1 **14 Claims**

1. An apparatus for dispensing cool beverages comprising in combination:

dispensing valve means for dispensing said cool beverages when said valve means is open;

receptacle means containing a flavor concentrate to be supplied to said dispensing valve means;

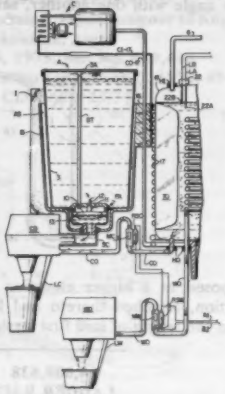
closed tank means for storing water to be supplied to said dispensing valve means;

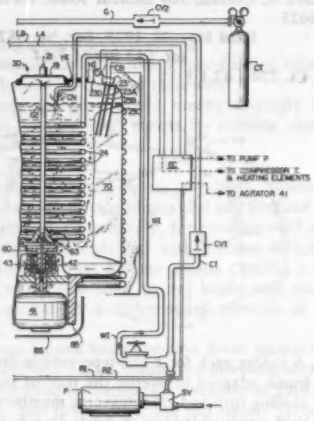
means for cooling said water in said tank means;

agitator means for circulating said water in said storage tank in response to the energization thereof; and

means for intermittently energizing said agitator means, including control means for sensing the opening of said dispensing valve means and energizing said agitator means in response thereto and time delay means for

de-energizing said agitator means a predetermined period of time after the closing of said dispenser valve means;





whereby freeze-ups in said storage tank are substantially precluded.

4,008,833

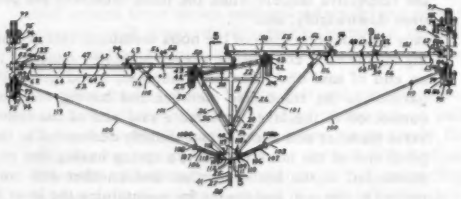
CHEMICAL APPLICATOR

Ebenhard S. Gandrud, 528 Gandrud Road, and Dale E. Gandrud, 640 Cardinal Drive, both of Owatonna, Minn. 55060

Filed Mar. 15, 1976, Ser. No. 666,885

Int. Cl.² A01C *15/00*

U.S. Cl. 222—178 **12 Claims**



1. An applicator for granular material comprising:

a. a rigid frame having means for connection to a draft vehicle;

b. a pair of laterally spaced wheels supporting said frame;

c. a pair of elongated rigid support members each having inner and outer ends;

d. means pivotally mounting said support members near their inner ends to said frame for swinging movements on horizontal axes, and for other swinging movements on vertical axes between operative positions wherein said members extend outwardly from opposite sides of said frame transversely of the direction of movement of said frame, and inoperative transport positions generally normal to said operative positions and in trailing relationship to said frame;

e. outer support means for supporting the outer ends of said support members in the operative and transport positions of said support members;

f. locking means for releasably locking said support members in both said positions of swinging movement on said vertical axes while permitting free swinging movement of said support members on said horizontal axes;

g. and elongated hopper means on each of said support members, said hopper means having inner ends arranged to be disposed in overlapping relationship when said support members are moved to said operative positions thereof.

4,008,834

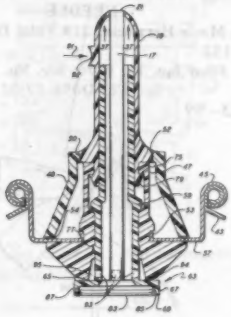
TIP SEAL FOR A DISPENSING VALVE

Edward J. Towns, Normandy Heights Road, Convent Station, N.J. 07961

Continuation-in-part of Ser. No. 426,351, Dec. 19, 1973, abandoned. This application July 18, 1975, Ser. No. 597,247

Int. Cl.² B65D *83/00*

U.S. Cl. 222—402.23 **23 Claims**



1. A tip seal for a dispensing container comprising:

a. a body having a hollow central portion with means in the bottom part of said hollow central portion for engaging the outlet of a container;

b. an inner elongated stem rigidly coupled to said body and extending at least partially within said central portion and projecting out of said body;

c. an outer stem slidably mounted over the upper portion of said body, said outer stem having an opening matching the end of said inner stem; and

d. a stretchable cylindrical member engaging the outside of the bottom portion of said body and the outside of said outer stem, said stretchable member having a stretchable portion of reduced diameter between its point of attachment with said body and its point of attachment with said outer stem, holding said outer stem in a position where its opening is covered by the end of said inner stem when said container is in a non-dispensing state and permitting separation of said outer and inner stems when dispensing through the action of pressure on the inside of said outer stem stretching said portions of reduced diameter to unseat said inner stem from said outer stem.

4,008,835

ANTITHEFT LOCKING STRAP FOR CLOTHING

Daniel A. Budzik, 211 May St., Elmhurst, Ill. 60126

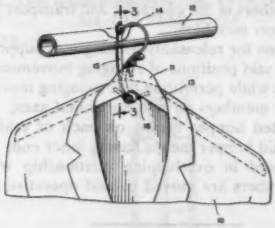
Filed Nov. 5, 1975, Ser. No. 629,101

Int. Cl.² A47J *51/095;* **E05B** *69/00*

U.S. Cl. 223—85 **4 Claims**

1. In combination, a clothes hanger having a hook supported by a hanger rack, an article of clothing supported by

the hanger and having a loop-providing opening therein, and an elongated antitheft locking strap, the locking strap having a first end portion which is provided with an opening through which the end of the hanger hook is inserted, an intermediate portion, a second end portion which is inserted through the



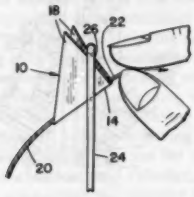
loop of the clothing and around the hook of the hanger, and means for releasably securing the second end portion to the intermediate portion whereby both ends of the strap are secured to the hanger hook and the locking strap prevents removal of the hanger from the rack and removal of the coat from the hanger.

4,008,836

YARN THREADER AND METHOD OF THREADING A NEEDLE

Gwendolyn Marie Herzstein, 219 Vidal Drive, San Francisco, Calif. 94132

Filed Jan. 15, 1976, Ser. No. 649,296
Int. Cl.² D05B *87/02*
U.S. Cl. 223—99 **5 Claims**



1. A yarn threader comprising a flat, stiff foldable generally planar member having a thickness sufficiently thin to permit its doubled thickness together with a thickness of yarn to be inserted in the eye of a needle when the end of the yarn is enfolded within the member, the member being folded along a crease, the folded member having transverse dimensions large relative to a needle eye, the folded member forming a projecting point at an end of said crease which will enter a needle eye sufficiently while enfolding the yarn end disposed within the folded member proximate the crease so that the yarn end may be grasped and the member removed from the eye thus leaving the needle threaded.

4,008,837

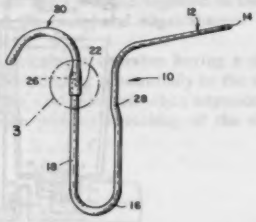
RUG NEEDLE

Susan A. Hull, Napa, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 10, 1976, Ser. No. 665,497
Int. Cl.² D05B *85/00*
U.S. Cl. 223—102 **8 Claims**

1. A needle comprising:

a first straight portion formed from a single length of rod or wire, substantially defining a first plane and having two ends, one of said ends being formed with a hook, an open-ended looped handgripping portion integral with said first straight portion and terminating in a second straight portion having said second end, a longitudinal saddle portion restable on the index finger of an operator terminating in a third substantially straight portion and substantially defining a second plane, and means for variably attaching said third straight portion to said second straight portion for said planes to subtend a selectable angle with one another, said saddle portion being



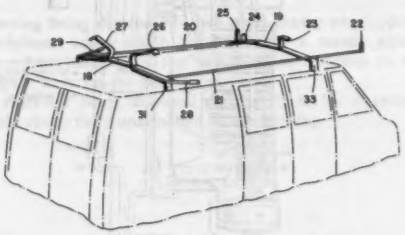
disposed at a higher elevation than said first straight portion, attached thereto and having a length smaller than the length of said first straight portion.

4,008,838

LADDER RACK

Richard R. Correll, 320 Escobar Road, Portola Valley, Calif. 94025

Filed May 30, 1975, Ser. No. 582,483
Int. Cl.² B60M *9/04*
U.S. Cl. 224—42.1 F **5 Claims**



5. A ladder rack for a van-type vehicle comprising:

a frame adapted to overlie the roof of the vehicle and including fore and aft transverse members adapted to support a pair of ladders in a side-by-side relationship;

means for mounting the frame to the roof of the vehicle;

a pair of hook members each having a pivot end pivotably attached to one of the transverse members intermediate the positions of the two ladders, said hook members each including an intermediate downwardly concave portion adapted to project outwardly over the inside rails of the respective ladders when the hook members are pivoted downwardly about their pivot ends, and an opposite free end adapted to project downwardly between the rails of the respective ladders when the hook members are pivoted downwardly; and

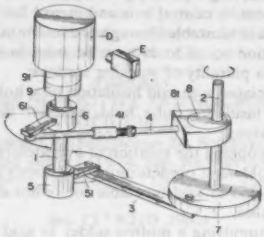
means for actuating each of the hook members, said actuating means each comprising a lever pivotably attached to an end of said one transverse member, a rod generally parallel to the transverse member and having one end connected to the lever proximate said end of the transverse member and another end slidably connected to the pivot end of the hook member, a spring having one end connected to the hook member and another end connected to the rod, and means for maintaining the lever in an over center position so that movement of the lever in one direction toward the over center position pivots the associated hook member downwardly from an upwardly raised release position to a ladder holding position with the intermediate portion of the hook member against one of the rails of the associated ladder and further movement of the lever in said one direction to the over center position compresses the spring against the hook member to bias and lock the intemediate portion of the hook member against the ladder.

4,008,839

TAPE FEEDING APPARATUS

Kyoichi Yamashita, Yokohama, Japan, assignor to Koyo Jidoki Kabushiki Kaisha, Yokohama, Japan

Filed Nov. 6, 1975, Ser. No. 629,414
Claims priority, application Japan, Nov. 7, 1974, 49-127542
Int. Cl.² B65H 23/18
U.S. Cl. 226—32 7 Claims



2. A tape feeding apparatus, comprising:

rotary shaft means having a rotary tape-feeding member connected thereto for rotation therewith;

first and second one-way clutch means drivingly connected to said rotary shaft means for rotating same in one direction only;

rotary driving means;

first and second linkage means drivingly connected between said rotary driving means and said first and second clutch means, respectively, for rotating said shaft means at different speeds and with a phase difference therebetween, said first linkage means causing a low-speed rotation of said shaft means while said second linkage means causes a higher-speed rotation of said shaft means;

said first linkage means including first lever means connected to said first clutch means for effecting rotation thereof in response to swinging movement of said first lever means, and first connecting rod means pivotally and drivingly connected between said first lever means and said rotary driving means, whereby said rotary driving means causes reciprocation of said first connecting rod means which thereby causes swinging of said first lever means;

said second linkage means including second lever means drivingly connected to said second clutch means for effecting rotation thereof in response to swinging movement of said second lever means, and second connecting rod means pivotally and drivingly connected between said second lever means and said rotary driving means, whereby said rotary driving means imparts a reciprocating motion to said second connecting rod means to thereby swing said second lever means;

said rotary driving means having first and second means associated therewith and drivingly connected to said first and second connecting rod means, respectively, for effecting reciprocating movement thereof with a phase difference therebetween so that said first connecting rod means is drivingly displaced in a direction for causing a low-speed rotation of the rotary shaft means shortly before the termination of the motion of the second connecting rod means in its driving direction;

sensing means coacting with the tape being fed from said rotary member for sensing an indicator or marking on the tape when said shaft means is being driven at said low speed; and

brake means for stopping said rotary member when said sensing means senses the indicator or marking on the tape.

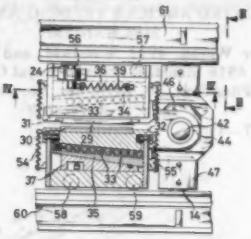
4,008,840

WORKPIECE TRANSPORTING APPARATUS

Horst Lorenz, Solingen, and Kurt Pauls, Langenfeld, both of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 10, 1975, Ser. No. 621,632
Claims priority, application Germany, Oct. 18, 1974, 2449579
Int. Cl.² B65H 17/34
U.S. Cl. 226—173 10 Claims

1. Apparatus for gripping an elongated workpiece and drawing it out of a machine tool, comprising transporting means comprising a chain movable in a predetermined direction; workpiece gripping means for gripping the workpiece, said gripping means being movable with said transporting means and also being movable relative to said transporting means in and opposite to said direction, said gripping means comprising gripping devices each including gripping jaw, at least one wedge-shaped roller-adjustable jaw holder, and at least one slidably mounted adjusting wedge; control means for controlling the relative movement between said gripping means and transporting means; an adjusting lever having one arm and another arm which is movably guided in said adjusting wedges; spring means connecting said arm with said adjusting wedges; and tensioning cam means extending substantially equidistantly along said chain and cooperating with said one arm of said adjusting lever.

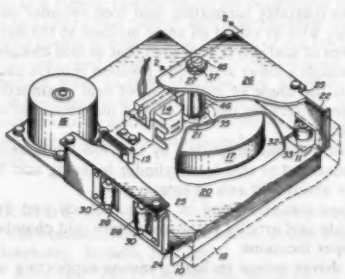


4,008,841

TWO PIECE SHEET METAL CAPSTAN HOUSING ASSEMBLY

Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 469,203, May 13, 1974, Pat. No. 3,921,881. This application Nov. 20, 1975, Ser. No. 633,738
The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.
Int. Cl.² B65H 17/20
U.S. Cl. 226—194 1 Claim



1. A capstan housing assembly in a tape player device of the type using an exchangeable cartridge including in combination:

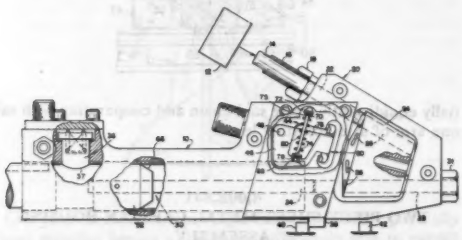
a capstan shaft,
first and second capstan bearings for supporting said capstan shaft,
a cartridge support member having a support wall having an opening therein adapted to receive said first capstan bearing, said first capstan bearing being supported by said support wall in said opening thereof,
first and second sidewalls spaced apart in relation to each other,
a support plate having an opening therein adapted to receive said second capstan bearing, said second capstan bearing being supported by said support plate in said opening thereof, said support plate being precisely positioned with respect to said cartridge support member to thereby accurately align said first and second capstan bearings,
means for fixedly connecting said cartridge support member and said support plate to said side walls to maintain said alignment and to form a cartridge receiving chamber,
said capstan shaft being supported by said bearings, whereby said capstan shaft is held in a predetermined location with respect to the cartridge receiving chamber.

4,008,842

ELONGATED ARTICLE FEEDING AND DRIVING MECHANISM

Robert Burr Wilson, 4912 Mansfield, and Steven Maitland Cochran, 4916 Mansfield, both of Royal Oak, Mich. 48073

Filed Sept. 10, 1975, Ser. No. 612,100
Int. Cl.² B27F *4/00*
U.S. Cl. 227—117 **6 Claims**



1. An article feeding and driving arrangement comprising:
a tool body;
a feed cylinder having a plurality of chambers extending in converging directions formed about the feed cylinder axis;
driver means including a driver tool adapted to be advanced along a line of movement;
means rotatably supporting said feed cylinder on said tool body with its axis at an angle inclined to the line of movement of said driver tool such that as said chambers rotate through a lower and upper position relative said cylinder axis the angle of inclination of said chambers becomes steeper relative the line of said movement of said driver tool;
indexing means supported by said tool body and drivingly connected to said feed cylinder indexing said feed cylinder about said axis of rotation;
passage means formed in said tool body and disposed to guide said articles successively into said chambers at said upper locations;
said driver means including means supporting said driver tool in alignment with said lower position so as to successively eject said articles from said chamber at said lower position upon advancement along said line of movement whereby said chambers at said upper location may be loaded with articles while articles may be ejected at said lower location.

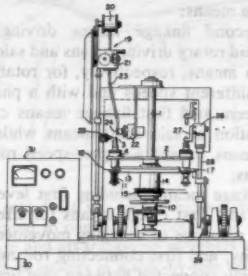
4,008,843

APPARATUS FOR SEALING TUBES

Kentaro Nagano; Ichiro Henmi, and Masahiro Kiyota, all of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 465,133
Int. Cl.² B23K *1/12*
U.S. Cl. 228—33 **4 Claims**

1. An apparatus for sealing insulation tubes comprising:
a turntable having a plurality of tube holders disposed in a circle about its central axis and means for intermittently turning said turntable through predetermined portions of a revolution so as to move said tube holders and said tubes to a plurality of working stations;
means associated with said insulation tube holders for rotating said insulation tube holders about their respective vertical axes;
means for stopping the rotation of a predetermined number of said holders at predetermined positions along the path of revolution of said turntable for removal of said tubes when sealed;
means for supplying a molten solder to said holders being rotated about their axes at a predetermined position in the revolution of said turn-table whereby the molten solder is distributed to the peripheral parts of the tube for sealing said tube;
means for heating said tubes at a plurality of predetermined positions along the path of revolution of said turntable so as to intermittently, yet gradually heat said tubes prior to said sealing of said tubes; and



said means for rotating said tube holders comprises a friction wheel co-axially disposed with respect to said turntable which contacts said tube holders below the surface of said turntable, said tube holders being disposed about the periphery of said friction wheel so as to be simultaneously driven thereby.

4,008,844

METHOD OF REPAIRING SURFACE DEFECTS USING METALLIC FILLER MATERIAL

David S. Duvall, Cobalt; William A. Owczarski, Cheshire; Daniel F. Paulonis, Moodus, and Robert P. Schaefer, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,613
Int. Cl.² B23K *31/02*
U.S. Cl. 228—119 **9 Claims**

1. The method of repairing surface and near-surface defects in a metallic article which comprises:
mechanically removing the defects from the article forming a cavity to be filled;
providing a metallic filler material mix comprising a blend of powders consisting of at least two distinct particulate components, the mix having a composition approximating that of the article, with a first powder component including in its composition a quantity of a melting point depressant such as boron substantially in excess of that in the article and sufficient to provide melting of a portion of the mix at a processing temperature below the melting temperature of the article, and a second powder compo-

nent having a composition which approximates that of the article being repaired with the ratio of the second powder component to the first powder component being from about 2:1 to about 9:1;

positioning the mix to fill the cavity;

raising the temperature of the article to the processing temperature whereat a portion of the mix liquefies;

holding the article at about the processing temperature and effecting isothermal resolidification of the mix by diffusion of the melting point depressant into the article being repaired and into the second powder component;

and continuing the exposure of the article to high temperature for homogenization of the filled volume.

4,008,845
METHOD OF POSITIVE AND NON-POSITIVE COLD-JOINING

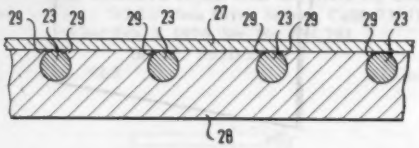
Richard Bleckmann, Imbergstrasse 24, Salzburg, Austria

Filed July 11, 1974, Ser. No. 487,633

Claims priority, application Germany, July 16, 1973, 2336149

Int. Cl.² B21D 39/03

U.S. Cl. 228—136 2 Claims



1. A method of joining a metallic first member to another metallic planar sheet member comprising the steps of providing a metallic first member and a metallic planar sheet member, providing at least one wire coil of metallic material having a hardness greater than the hardness of said sheet member, securing said wire coil to said first member, moving said metallic members together with at least a portion of said wire coil therebetween, compressing said metallic members into overlying, flush engagement to enclose said at least a portion of said wire coil with the material of said sheet member and thereby cold-join said metallic members together in a securely bonded relationship.

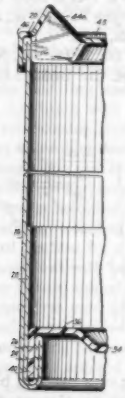
4,008,846
LEAKPROOF PAPERBOARD CONTAINER

Robert L. Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed May 10, 1976, Ser. No. 685,014

Int. Cl.² B65D 3/04, 3/10

U.S. Cl. 229—4.5 33 Claims



1. A leakproof, three-piece container suitable for shipping and storing liquids, frozen liquids, moisture sensitive materials and the like, which maintains its leakproof condition when subjected to impact occasioned by the dropping of the container on its base portion during shipping and storage, comprising:

a generally cylindrical body wall portion and base wall portion constructed from a unitary, thermoplastic coated paperboard blank, said body wall portion foldably connected to said base wall portion; said base wall portion comprising a plurality of foldably connected panels, said panels being folded to form first and second upstanding members defining an annular channel therebetween; said first upstanding member comprising at least one panel, which panel lies in face-to-face contact with the lower surface of said cylindrical body wall portion, wherein at least said one panel of said first upstanding member is of greater height than the height of the second upstanding member;

a first end closure member having a downwardly projecting peripheral flange for sealing the lower end of the container, said flange occupying the annular channel formed between said first and second upstanding members; and

a second end closure member for sealing the upper end of said container.

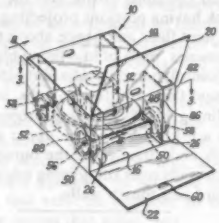
4,008,847
SHIPPING CONTAINER

John C. Davis, 1154 W. Mallard Drive, Palatine, Ill. 60067

Filed May 20, 1976, Ser. No. 688,383

Int. Cl.² B65D 5/50, 5/44, 25/14

U.S. Cl. 229—14 C 7 Claims



1. A one-piece fiberboard container for containing a lawnmower having a frame with four wheels, each carried on an axle substantially at four corners of said frame, said container comprising a top wall, a bottom wall and a pair of opposed sidewalls extending between and joining said top and bottom walls to form a generally tubular compartment with open fore and aft ends for containing said lawnmower in-line with said ends, side end flaps foldably attached to each end of said side walls, each of said side end flaps having an insert portion and an intermediate portion between said insert portion and the side wall to which it is attached, said intermediate portion being disposable at substantially right angles to said sidewall at the end of said container, said insert portion being foldable to extend into said tubular compartment for positioning between said frame and one of said wheels, said insert portion including a right-angled recess to nest against the axle of the lawnmower container therein, and closure flaps foldably secured to said top and bottom walls to close the fore and aft ends of said tubular compartment over said side end flaps, and substantially perpendicular to said insert portions, each of said closure flaps further extending substantially between said top and bottom walls.

4,008,848
CUP FORMED CONTAINER HAVING A LINING FOIL

Od Wikar Christensson, Stockholm, Sweden, assignor to Esseltepac Aktiebolag, Jarfalla, Sweden

Filed Nov. 24, 1975, Ser. No. 634,770

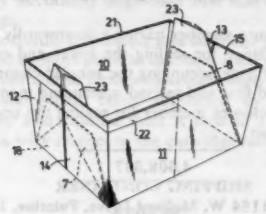
Claims priority, application Sweden, Dec. 10, 1974, 7415449

Int. Cl.² B65D 5/22, 25/14

U.S. Cl. 229—31 R 9 Claims

1. A cup formed container comprising an outer container made of a plain punched blank of cardboard or similar stiff

material comprising a bottom, two opposite side pieces foldably connected with said bottom along opposite first and second edges thereof and forming first and second opposite walls, said side pieces being extended at their ends so as to be longer than said first and second edges with which they are foldably connected, the extended ends of said side pieces being folded upwardly and inwardly from the blank form to form at least in part third and fourth opposite walls, two opposite joint flaps foldably connected to opposite third and fourth edges of said bottom and folded upwardly to lie adjacent and opposite said extended ends of said side pieces and cooperate therewith in forming said third and fourth walls, said joint flaps being no longer than said third and fourth edges, and a unitary inner lining blank extending over substantially the



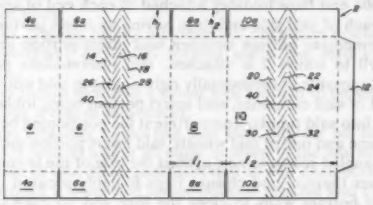
entire surface of the outer container blank and adhered to at least the great majority of said surface to form an integral part of the combined container blank and the formed container, said lining blank having portions projecting a distance radially outside of said joint flaps and hence above the intended upper edge of the container, parts of said lining blank being folded in between each joint flap and its adjacent extended ends of said side pieces in said third and fourth walls, said projecting portions of said lining blanks forming projecting folded lining tongues which are folded over the upper edges of said third and fourth walls and attached to the outside surfaces of said third and fourth walls over the joining edges of said extended ends in said third and fourth walls.

4,008,849

BIDIRECTIONAL TEAR STRIP MEANS FOR CARTONS AND THE LIKE

Donald D. Baber, Boise, Idaho, assignor to Boise Cascade Corporation, Boise, Idaho

Filed May 14, 1976, Ser. No. 686,641
Int. Cl.² B65D *5/54, 85/00, 71/00*
U.S. Cl. 229—51 TS **18 Claims**



1. In a unitary blank for forming a container, the invention which comprises

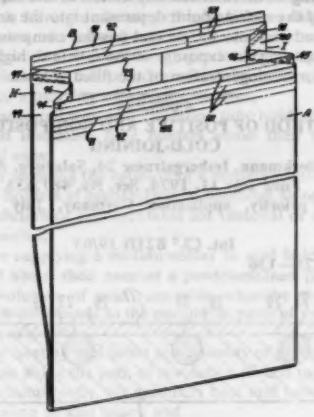
means defining a pair of contiguous tear strips operable in opposite tearing directions, respectively, said tear strip defining means including three generally parallel rows of slits, the slits of each row being generally parallel and arranged at an acute angle relative to the longitudinal axis of the associated tear strip, the slits of successive rows defining a herringbone pattern with the slits of the rows of one tear strip diverging in one direction relative to the longitudinal axis of said one tear strip, and the slits of the rows of the other tear strip diverging .in the opposite direction relative to the longitudinal axis of the other tear strip, thereby to define said opposite tearing directions.

4,008,850

GUSSETED PINCH BOTTOM BAG

John J. Goodrich, Rumford, R.I., assignor to St. Regis Paper Company, New York, N.Y.

Continuation of Ser. No. 169,287, Jan. 29, 1962, abandoned.
This application Feb. 22, 1972, Ser. No. 228,255
Int. Cl.² B65D *33/02*
U.S. Cl. 229—55 **1 Claim**



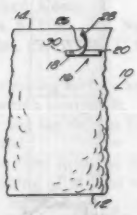
1. A bag of tubular form comprising a plurality of plies of flexible sheet material, said bag having a front surface and an oppositely disposed rear surface with the rear surface adapted to overlap said front surface in assembled relationship, said bag being longitudinally and reversely creased along diametrically opposed portions to provide a pair of oppositely disposed gussets, each gusset comprising front and rear gusset portions interposed between said front and rear surfaces and connected thereto to form said tube, said plies being successively stepped with respect to each other to form said rear surface and reversibly stepped with respect to each other to form said front surface at each end of said tube, and selected plies being stepped in a first direction with respect to each other in said front gusset portions and in a reverse direction in said rear gusset portions at each end of said tube, and one end of said tube including all of said plies being folded against said front surface and adherently secured in position.

4,008,851

ADHESIVE TAPE BAG CLOSURE

John L. Hirsch, Sheboygan Falls, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jan. 16, 1976, Ser. No. 649,879
Int. Cl.² B65D *33/24*
U.S. Cl. 229—62 **2 Claims**



1. The combination of a bag and bag closure in which the bag closure comprises an elongated flexible closure tape, means relatively permanently attaching one end portion of said tape to the bag near its open end, a strippable adhesive

means between said tape and said bag in the area where the tape is not relatively permanently attached to said bag, whereby the portion of said tape which is not relatively permanently attached to said bag is strippably attached thereto and can be subsequently stripped away from said bag to serve as an adhesive closure tape for said bag, the portion of said tape which is relatively permanently attached to said bag serving as an anchor for said adhesive closure tape, a flexible foundation strip between said closure tape and said bag, said foundation strip being relatively permanently attached to the outer surface of said bag, and said one end portion of said closure tape being relatively permanently attached to a portion of the outer surface of said foundation strip, the outer surface of another portion of said foundation strip comprising a release surface for said strippable adhesive means.

4,008,852

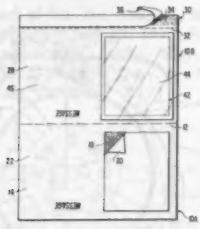
APERTURED MAILING CARD AND METHOD OF USING

Elmer O. Davis, 762 La Mesa Drive, Salinas, Calif. 93901

Filed Feb. 3, 1976, Ser. No. 654,794

Int. Cl.² B65D *27/04*

U.S. Cl. 229—92.3 **2 Claims**



1. A mailing card comprising:

a first card section formed of paper material and having first and second sides;

said first side of said first card section containing an adhesive surface for carrying an object such as a photograph;

a removable backing sheet overlying said adhesive substance;

a second card section formed of paper material attached to said first card section and having an first side contiguous with said first side of said first card section, and a second side contiguous with said second side of said first card section, said second card section including,

an opening situated for general alignment with said adhesive surface when said first and second card sections are in a folded condition with said second sides disposed in facing relationship, and

a transparent cover extending across said opening; and

a sealing strip extending along said second card section so as to extend beyond said first and second card sections when said card sections are in a folded condition, said sealing strip including an adhesive sealing area and being joined to said second card section by a fold line so as to be foldable into enagagement with said first card section to secure said sections in said folded condition for mailing;

said second side of said first card section and said second side of said second card section each including preinscribed indicia indicating the positioning of a mailing address and postage to be applied thereto,

said first and second card sections being foldably attached along a perforation to enable said first card section to be optionally manually detached from said second card section and mailed separately as a postcard.

4,008,853

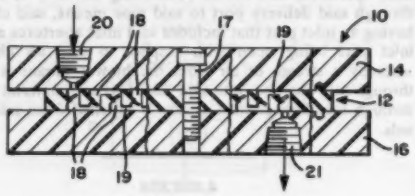
PRESSURE RESPONSIVE SELF-PURGING EMITTER

Kenneth C. Tregillus, Yellow Springs, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Oct. 31, 1975, Ser. No. 627,598

Int. Cl.² B05B *15/00*

U.S. Cl. 239—542 **13 Claims**



1. A pressure responsive emitter comprising:

a. an emitter body,

b. means defining an inlet into said body and an outlet therefrom,

c. a flow path through said body interconnecting said inlet and said outlet,

d. a plurality of discrete valves each positioned in spaced relationship to each other along said flow path,

e. said valves being formed of an elastomeric material and each consisting of an individual lip cantilevered into said flow path from one wall portion thereof and cooperating about its periphery with opposing wall portions of said flow path to effect a valving action,

f. each of said valves being responsive, below a predetermined maximum pressure, to decrease the flow area of said flow path at that valve in response to increases in the pressure drop across that valve and, above a predetermined minimum pressure, to increase the area of said flow path at that valve in response to decreases in the pressure drop across that valve, and

g. each of said valves being responsive to an increase in the pressure drop across that valve above said predetermined maximum pressure to thereafter increase the area of said flow path at that valve and permit accumulated material to pass through that valve.

4,008,854

SPREADING IMPLEMENTS

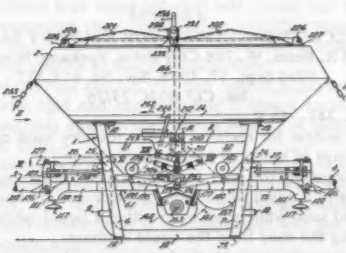
Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Filed Jan. 13, 1975, Ser. No. 540,327

Claims priority, application Netherlands, Jan. 18, 1974, 7400683

Int. Cl.² A01C *3/06*

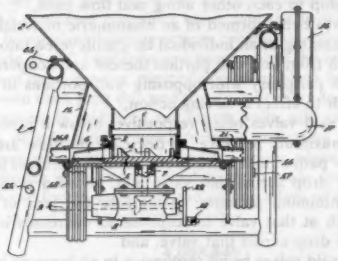
U.S. Cl. 239—655 **87 Claims**



1. A spreading implement comprising a substantially her-

metically enclosed hopper means for material to be spread and an air chamber with blower means being in communication with said hopper means, at least one delivery port in said hopper means and distributor pipe means extending outside of said hopper means adjacent said delivery port, inlet apertures in elongated channels of said distributor pipe means in communication with said delivery port during operation, a flow-control device positioned between said delivery port and said inlet apertures, said device controlling the flow of material through said delivery port to said pipe means, said channels having an inlet part that includes said inlet apertures and said inlet part being open with respect to said air chamber, whereby a stream of air from the blower means is forced through said chamber into said inlet part and material passing through said flow-control device is expelled from said channels.

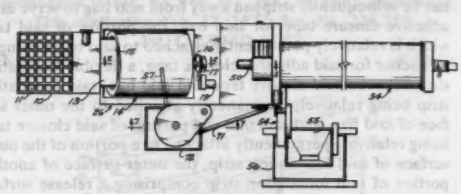
4,008,855
SPREADING IMPLEMENTS
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Apr. 15, 1975, Ser. No. 568,262
Claims priority, application Netherlands, Apr. 25, 1974, 7405556
Int. Cl.² B67D *5/60*
U.S. Cl. 239—682 **32 Claims**



1. A spreading implement comprising a frame and a container for material to be spread, the lower part of said container having port means and a rotatable ejector disc, a plurality of elongated delivery ducts extending substantially horizontally from said container in directions generally transverse to the normal direction of travel of the implement, the inner ends of said ducts being in communication with said port means and an air chamber that surrounds said port means, a pneumatic device communicating with said chamber and said ducts, the outer ends of said ducts being spaced apart from one another and being located at different lateral distances from said ejector disc, a movable spreading member being positioned adjacent each outer end and driving means associated with said spreading member, said driving means moving the spreader members to uniformly distribute material over a broad path during operation.

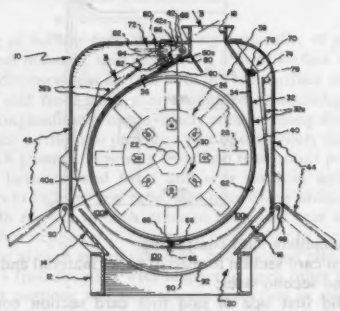
4,008,856
RECLAIMING SYSTEM FOR FOUNDRY SAND
Edward A. Sears, W. 708 Cliff Drive, Spokane, Wash. 99204
Filed Sept. 17, 1975, Ser. No. 614,323
Int. Cl.² B02C *23/36*
U.S. Cl. 241—46 R **3 Claims**

1. A system for reclaiming used foundry sand containing solid lumps of sand and binder, comprising:
- disintegrating the sand and binder into discrete solid particles in a liquid suspension by mechanically crushing the used sand while washing it within a liquid medium;
- settling the sand from the liquid medium;
- mechanically removing the heavier particles of settled sand; and
- continuously drying the sand as it is removed by passage of the sand along first and second successive elongated drying drums, the air system through the drums being connected in tandem, with fresh air being drawn into the sand exit end of the second drum, along the length of that



drum to its sand input end, then mixed with heated air at the sand exit end of the first drum, the flow of sand being opposite to the flow of air in both drums.

4,008,857
SCREEN MILL
Harry D. Schutte, Amherst, N.Y., assignor to Schutte Pulverizer Co., Inc., Buffalo, N.Y.
Filed June 10, 1976, Ser. No. 694,556
Int. Cl.² B02C *23/16*
U.S. Cl. 241—89.2 **6 Claims**



1. A hammer mill comprising in combination:
- a casing bounding a chamber and having upper material inlet and lower material discharge openings communicating with said chamber, said casing being defined by opposite side walls and a cover extending between said side walls, said cover having horizontally opposite portions thereof defining access doors for affording operator access to said chamber intermediate said inlet and discharge openings;
- a horizontally disposed and rotatable drive shaft projecting through said side walls;
- a rotor assembly fixed for rotation with said drive shaft within said chamber and including a plurality of hammers arranged for movement along a path of travel disposed concentrically of the axis of said drive shaft;
- generally arcuately shaped ledge means fixed one to each of said side walls to project inwardly of said chamber, said ledge means defining generally aligned bearing surfaces disposed to face outwardly of said axis and extend circumferentially of said rotor intermediate said path of travel and said cover between opposite sides of said inlet opening;
- a generally arcuately shaped screen device sized to bridge essentially between said side walls for opposite marginal edge bearing engagement with said bearing surfaces and to extend essentially between said opposite sides of said inlet opening;
- a mounting device carried by said casing adjacent one on

said opposite sides of said inlet opening for removably mounting one end of said screen device;

a clamping device carried by said casing adjacent a second of said opposite sides of said inlet opening for removably mounting an opposite end of said screen device and for drawing said screen device intermediate its ends into bearing engagement with said bearing surfaces, said screen device including at least two arcuately shaped and end-to-end connected screen sections, said screen sections having their adjacent ends hingedly connected, said access doors normally covering access openings arranged to afford access one to each of said mounting device and said clamping device and sized to permit removable insertion of at least one of said screen sections therethrough.

4,008,858

TREATING DEVICE FOR SYNTHETIC RESIN WASTE

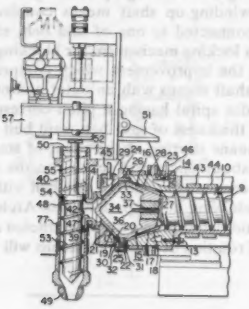
Masatora Yamada, Iwata; Shigeo Tasaka, Tokyo; Tadayuki Okawa, and Taichi Suzuki, both of Ibaragi, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Continuation-in-part of Ser. No. 358,923, May 10, 1973, abandoned. This application July 22, 1975, Ser. No. 598,121

Claims priority, application Japan, May 12, 1972, 47-55244[U]; June 29, 1972, 47-64457; Nov. 4, 1972, 47-110507

Int. Cl.² B02C *7/175*

U.S. Cl. 241—101.2 **3 Claims**



1. Apparatus for treating synthetic resin waste comprising a first cylinder, a rotary driven first screw in said first cylinder having a rotary body thereon for grinding resin waste and extruding it in a plastic state, means defining a raw material feed zone on said first cylinder, means defining a discharging portion for the resin waste in a plastic state, a deairing and back-pressure increasing device having a transfer port in communication with said discharging portion and comprising a second screw rotatably driven about an axis thereof transversely to the axis of said first screw, a second cylinder containing said second screw in communication with said transfer port and having an outlet through which treated resin waste is delivered by said second screw, said second screw having a flange portion disposed circumferentially of said second screw, said transfer port being disposed between said outlet and said flange portion, and said flange portion being of lesser diameter than said second cylinder defining therewith a deairing gap for passing volatized matter without escape of the resin in a plastic state therethrough.

4,008,859

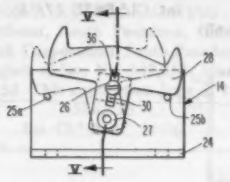
STRAND WINDING

Ralph W. List, East Lansdowne, and Robert K. Stanley, Media, both of Pa., assignors to Textured Yarn Co., Inc., Kennett Square, Pa.

Division of Ser. No. 467,018, May 6, 1974, Pat. No. 3,936,006. This application Jan. 20, 1975, Ser. No. 542,502

Int. Cl.² B65H *67/04, 57/00*

U.S. Cl. 242—18 A **5 Claims**



4. Inertial delay flip-flop guide for textile strands, comprising a fixed base portion having a pivot therein, a rigid portion upstanding from the base pivot and having strand-guiding surfaces thereon, and weight means attached to the upstanding portion to alter the force required to flip the guide from either of two strand-guiding positions to the other.

4,008,860

PAPER BOBBINS

Junkichi Tanaka, Osaka, Japan, assignor to Tanaka Paper Tube Co. Ltd., Osaka, Japan

Filed Apr. 28, 1975, Ser. No. 572,213

Int. Cl.² B65H *54/54, 75/10, 75/30*

U.S. Cl. 242—46.21 **3 Claims**

1. A discardable paper bobbin assembly for use on a metal bobbin spindle drive, which spindle drive is of the type that includes a vertically disposed shaft extending upwardly from a drive connection having a fitting face on which at least one horizontal straight surface is defined, with paper bobbin assembly includes:

a. a paper tubular body having first and second ends and an elongate longitudinal bore, said paper tubular body adjacent said second end having a cut-out portion, with said longitudinal bore being adjacent said second end and of such transverse cross section as to slidably engage said drive connection when said cut-out portion is oppositely disposed relative to said straight surface;

b. an end cap that extends into said bore adjacent said first end, with said end cap including a biased means that non-rotatably engages the interior surface of said paper tubular body;

c. an internal bearing disposed in a fixed position in said bore intermediate said first and second ends of said tubular body, with said bearing rotatably engaging said shaft when said tubular body is in engagement with said drive connection; and

d. fastening means removably engaged in said cut-out portion, with said fastening means in pressure contact with

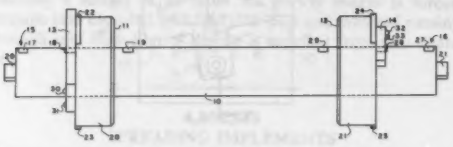
said flat surface of said drive connection to prevent said paper tubular body from rotating relative to said drive connection.

4,008,861

WEB ROLL RETAINER

Heinz E. Hertel, Mount Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 18, 1975, Ser. No. 605,486
Int. Cl.² B65H *17/02*
U.S. Cl. 242—68 **10 Claims**



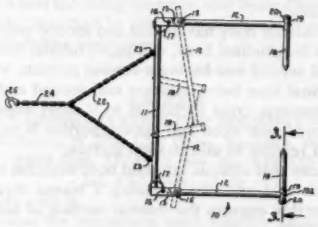
1. A web roll retainer comprising:
an axial support bar having first and second ends;
first and second roll end supports mounted on said axial support bar in non-rotational relation to said support bar, said first end support being near said first end and said second end support being near said second end for supporting a web roll extending therebetween, and each of said first and second roll end supports including an annular bearing surface communicating with the web roll and web roll confining means for minimizing axial movement of the web roll on said end supports; and
end support holding means for maintaining said end supports in fixed axial relation on said support bar wherein said end support holding means includes at least one notch in said support bar near said first and second ends and a latch on each roll end support, a respective given one of said latches engaged with a respective given one of said notches to thereby maintain said end supports in fixed axial relation on said support bar; whereby,
as the web is withdrawn from the roll, said web roll confining means maintain the web roll in substantially fixed axial position and said annular bearing surfaces provide continuous resistance to web roll rotation through friction resulting from the gravitational force between the web roll and said annular surfaces.

4,008,862

BALE UNROLLING DEVICE

Raymond G. Wilmes, Rte. 2, Maryville, Mo. 64468

Filed Apr. 28, 1976, Ser. No. 681,278
Int. Cl.² B65H *75/46*
U.S. Cl. 242—86.5 R **10 Claims**



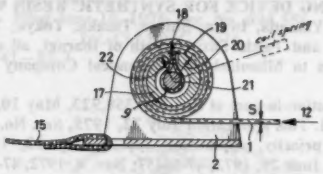
1. Apparatus for unrolling large hay bales comprising:
a cross member;
a pair of foldable arms;
means coupling said arms with the cross member for pivotal movement about respective pivot axes located in proximity to the opposite ends of the cross member and offset from said cross member, said arms being pivotal about said axes between a folded position lying generally parallel to said cross member and a bale engaging position wherein the arms are substantially perpendicular to said cross member and substantially parallel to one another;
means for locking said arms in the bale engaging position; and
a pair of spikes projecting from the ends of the arms remote from said pivot axes, said spikes pointing generally toward one another to penetrate opposite ends of a bale when said arms are in the bale engaging position.

4,008,863

WINDING-UP ROLLER FOR SAFETY BELTS

Artur Föhl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

Continuation of Ser. No. 317,356, Dec. 21, 1972, abandoned. This application Oct. 8, 1974, Ser. No. 513,119
Claims priority, application Germany, Dec. 22, 1971, 2163788
Int. Cl.² A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.4 B **6 Claims**



1. In the combination with a safety belt, of an impact emergency blocking belt winding-up roller system having a return spring and winding-up shaft means coupled to said return spring and connected to one of said belt, said roller system also having a locking mechanism for blocking further pull-out of said belt, the improvement which comprises forming said winding-up shaft means with an outer contour in the path of an Archimedes spiral having a pitch corresponding substantially to the thickness of said belt, said belt being wound on said shaft means starting at the point of smallest radius and proceeding about said spiral surface to the point of greatest radius, the contacting surface of said belt with the shaft means and with itself lying in the path of said Archimedes spiral, so that when said belt is drawn out or retracted at a uniform rate, the speed of rotation of said shaft means will vary at a uniform rate.

4,008,864

LOCKING MECHANISM FOR A SAFETY BELT

Nils Gustav Yngve Torphammar, Ostermalmsvagen 6, S-612 00 Finspang, and Per Gustav Torphammar, Surbrunnsgatan 8, S-411 19 Goteborg, both of Sweden

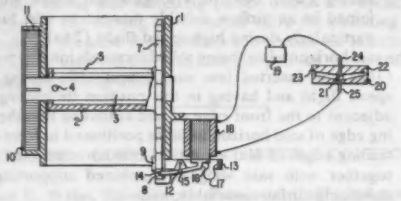
Filed Feb. 18, 1975, Ser. No. 550,398
Claims priority, application Sweden, Feb. 18, 1974, 7402102
Int. Cl.² A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 R **5 Claims**

1. In a safety belt of the type including a rotatable storage reel on which the belt may be automatically wound, a ratchet wheel connected to the reel, pivot means, a locking mechanism including pawl means mounted on said pivot means for engaging the ratchet wheel to prevent rotation of the storage reel, a lever having an arm contacting the pawl for actuating it and inertia responsive release means for operatively releasing the lever, the improvement in locking mechanism means comprising:
an oval shaped bearing hole located within the pawl means for permitting sliding movement of the pawl on the pivot

means in addition to pivoting movement when the pawl engages the ratchet wheel for locking,

a recess means formed on the pawl means for receiving the arm of the lever,

the recess means defining a cam-like surface on which the lever arm slides,



the cam-like surface of the recess means being shaped so as to cause the lever arm sliding thereon to move to the position it occupied prior to its release by the inertia responsive release means when the pawl undergoes sliding movement on the pivot means, and

means for biasing the lever arm to move the pawl into engagement with the ratchet wheel when the inertia responsive release means releases the lever.

4,008,865

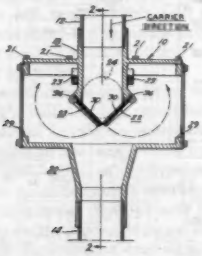
VALVE FOR PNEUMATIC TUBE TRANSPORTING SYSTEM

Chester N. White, Moylan, and John F. Lindsay, Wilmington, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 25, 1975, Ser. No. 616,738

Int. Cl.² B65G *51/04*

U.S. Cl. 243—6 **4 Claims**



1. In a pneumatic tube delivery system wherein adjacent pneumatic tube sections are serviced by separate air flow sources and wherein a valve must be provided to separate and seal the adjacent tube sections such that the air flow sources do not work against each other, an improved valve for separating and sealing adjacent tube sections and comprising:

a. a valve housing;

b. an entrance tube into said valve housing;

c. said entrance tube having a pair of flap seals with each flap seal being located on an opposite side of said entrance tube;

d. spring means for biasing each of said flap seals closed to seal the valve and also to absorb the shock encountered by each flap seal when a container traveling through the pneumatic tube delivery system kicks open the flap seals;

e. said housing further having shock absorbing means positioned by each flap seal to encounter each flap seal after the flap seal has traveled through an arc of greater than 180°, such as if the flap seal is kicked open by a container and travels against the action of said spring means beyond a predetermined point it will encounter said shock absorbing means to stop the flap seal and whereby said arc of greater than 180° allows said spring mean a substantial arc to absorb the shock encountered by each flap seal; and

f. an exit tube from said housing providing for the passage of a container from the valve.

4,008,866

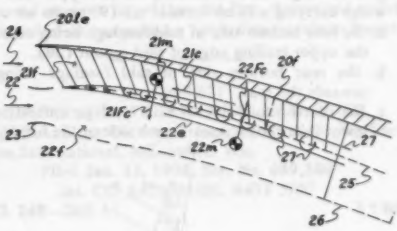
COMPRESSION ENERGY TRANSFORMATION SYSTEM FOR A SUPERSONIC WING

Scott Carson Rethorst, South Pasadena, Calif., assignor to Vehicle Research Corporation, South Pasadena, Calif.

Continuation-in-part of Ser. No. 342,151, March 16, 1973, Pat. No. 3,904,151. This application June 6, 1975, Ser. No. 584,635

Int. Cl.² B64C *21/00*

U.S. Cl. 244—1 N **5 Claims**



1. An aircraft wing system to fly at supersonic speeds, said wing system comprising a wing having:

a lower surface element having its leading edge at substantially zero angle of attack and having a major portion of its downward concave curvature in its forward extent; said wing generating a compression layer of air thereunder; and

an underwing nozzle to emit a supersonic jet of fluid at a pressure greater than atmospheric comprising an expansion layer located below said compression layer wherein the correlation of the wing compression layer at the forward past of the wing and the short jet expansion concentrates density changes produced by said wing and said nozzle in adjacent regions and generates both (1) opposing sign perturbation velocities on the interface between the compression layer and the expansion layer, thereby invoking viscous forces to generate an ordered form of vorticity by spinning elements of said layers about spanwise axes, and (2) equal magnitude and opposite sign Coriolis reaction forces due to the contrasting changes in angular momentum of said layers as said layers are turned downward by the wing, and thereby forming a mechanism to feed energy into the vorticity generation process, and providing a downstream upwash producing at supersonic speeds an increased pressure on the lower surface enabling the wing to operate at a lesser angle with reduced drag.

4,008,867

AIRCRAFT WITH SAFETY TAIL UNIT

Herbert M. Kaulut, Orrerweg 33/35, 5000 Cologne 71, Germany

Continuation-in-part of Ser. No. 508,319, Dec. 4, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 633,994

Claims priority, application Germany, Aug. 16, 1974, 2439479

Int. Cl.² B64C *5/02*

U.S. Cl. 244—87 **11 Claims**

1. In a supersonic aircraft having a variable geometry horizontal tail which is movable in longitudinal direction of aircraft and which for low-speed flight and particularly for take-

off and landing is moved to a rearward position but which for high-speed flight is moved to a forward position (FIG. 1; FIG. 2; FIG. 5 and FIG. 6), the improvement comprising:

a pair of wings of invariable aspect ratio and of deep profile chords at the roots of said wings with decrease in the profile chords towards the tips of said wings (2; 20) having in the trailing edges a common cutout (30) positioned symmetrically with respect to the symmetrical axis of said pair of wings,

a. the said cutout (30) accommodating landing flaps (18*a*; 18*b*) positioned along the upper trailing edge of said cutout,

b. the said wings (2; 20) including ailerons (16) positioned along the trailing edges of said wings, but outside of said cutout (30),

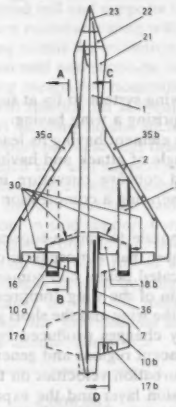
c. the said wings (2; 20) including slats (35*a*; 35*b*) positioned along the leading edges of said wings,

a fuselage (1) positioned on said symmetrical axis of said pair of wings and substantially on the upper side of said wings carrying a fixed vertical tail (9) on its aft end,

a. the rear bottom side of said fuselage being adjacent to the upper trailing edge of said cutout (30),

b. the rear bottom side of said fuselage being risen towards the rear,

c. the rear bottom side of said fuselage embodying two lower rails (34*x*), one on each side of the fuselage, and



two upper rails (34*y*), one on each side of the fuselage, for the rearward and forward movement of the horizontal tail,

d. the rear fuselage embodying control means for the rearward and forward movement of the horizontal tail, and control means for the engagement and disengagement of said landing flaps,

e. the front fuselage carrying a horizontal front plane (21) of a spearhead shape, comprising a front trimming flap (22) and a front elevator (23),

f. the front fuselage embodying control means for said front trimming flap and for said front elevator,

at least two jet engines placed on the bottom side of said wings,

a horizontal tail (10*a*; 10*b*) in a continuous one piece monocoque construction from one side to the other side of the aircraft arranged transversally under the rear bottom side of said fuselage,

a. the said horizontal tail having outer dimensions that correspond to the dimensions of said cutout (30),

b. the said horizontal tail having longitudinal control elevators (17*a*; 17*b*) positioned along the trailing edge of said horizontal tail, but being omitted in the engine cowl-areas and in the fuselage area,

c. the said horizontal tail carrying on its upper surface two front brackets (55*x*) with front rollers (54*x*) engaging said two lower rails (34*x*), and two rear brackets (55*y*) with rear rollers (54*y*) engaging said two upper rails (34*y*) (FIG. 7) and said rollers are rolling along said rails when said horizontal tail is moved rearwards or forwards,

d. the said horizontal tail carrying on its upper surface a fairing (24*a*; 24*b*) of a longitudinal shape which is joined in an airflow suitable manner to said fuselage particularly during high-speed flight (24*a*),

the said horizontal tail being rolled forwards into the position (10*a*) and inserted into said cutout (30) during high-speed flight and having in this position its leading edge adjacent to the front edge of said cutout so that the leading edge of said horizontal tail is positioned in front of the trailing edges of said wings and said horizontal tail forms together with said wings a combined supporting and stabilizing surface assembly, and

the said horizontal tail being rolled rearwards and away from said wings for low-speed flight and placed in its rear position (10*b*) to form a separate horizontal tail in the rear of said aircraft.

4,008,868

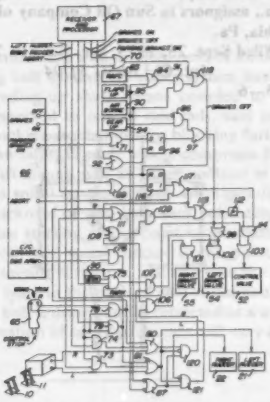
AIRCRAFT STEERING AND BRAKING SYSTEM

Alan Berg, Horsham, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 18, 1975, Ser. No. 641,849

Int. Cl.[2] B64C *25/48*

U.S. Cl. 244—111 **4 Claims**



1. A steering and braking system for an aircraft while groundborne comprising in combination:

a pair of hydraulically operated brakes formed to be operatively connected to main landing wheels of the aircraft;

a hydraulic fluid supply;

a first pair of brake valves each having an inlet connected to receive high-pressure fluid from said supply, a first outlet for returning said fluid to said supply, and a second outlet for delivering a fluid control pressure in response to a command signal to said valve;

a pair of foot pedals operatively connected to respective ones of said first pair of brake valves for providing said command signal as a function of braking force to be applied to the wheels;

a control valve having an input connected to receive a reduced pressure fluid from said supply and for selectively passing said fluid to the outlet thereof;

a second pair of brake valves each having an inlet connected to the outlet of said control valve, a first outlet for returning said fluid to said supply, and a second outlet for delivering a controlled fluid pressure;

a pair of shuttle valves each having an outlet for delivering the fluid from either of two inlets having the fluid pressure, said first inlet connected to the second outlet of respective ones of said first and second pairs of brake valves; and

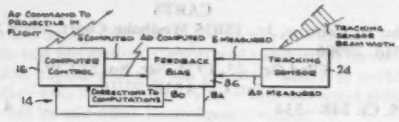
circuit means for selectively opening said second pair of brake valves and including pulser means for cyclically opening and closing said control valve for pulsating the reduced pressure fluid, and switch means for selectively opening and closing said second pair of brake valves separately or in unison.

4,008,869

PREDICTED - CORRECTED PROJECTILE CONTROL SYSTEM

Herbert K. Weiss, Palos Verdes Pennisula, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 7, 1976, Ser. No. 647,293
Int. Cl.² F42B *15/00, 15/10, 13/30*
U.S. Cl. 244—3.13 **9 Claims**



1. A projectile control system where the projectile follows a determinable minimum energy path to an intercept point with a selected target, the projectile control system comprising:

a. first means for continuously tracking the selected target by a sensor beam having a determinable finite dimension and for generating a first means target signal corresponding at least to the azimuth and range of said tracked target,

b. said first means further being for terminally tracking both the projectile and target within said sensor beam and further for generating a first means projectile signal corresponding at least to the azimuth and range of said terminally tracked projectile,

c. second means responsive to said first means target signal for generating a ballistic data signal for the projectile so that the projectile, having an independent flight control system responsive to internally stored ballistic data and to said ballistic data signal, is deployed along a minimum energy path to an initial target intercept, and

d. third means responsive both to said first means target signal and first means projectile signal and to said ballistic data signal for generating a bias signal for said second means,

d. said second means being further responsive to said bias signal for generating a corrected ballistic data signal for the projectile so that the projectile is continuously adjusted in flight to follow the minimum energy path to a terminal target intercept when said first means tracks both the selected target and the projectile.

4,008,870

RAILROAD TRACK ALARM

Harry R. Gardner, White Rock, and Charles D. Marlatt, North Vancouver, both of Canada, assignors to Western Railspan Inc., White Rock, Canada

Filed Apr. 21, 1975, Ser. No. 570,274
Claims priority, application Canada, Feb. 25, 1975, 220944
Int. Cl.² B61L *23/04;* **H01H** *3/02*
U.S. Cl. 246—120 **14 Claims**

1. A railroad track alarm actuator comprising:

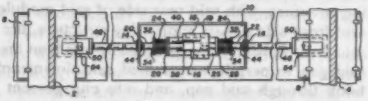
a switch box mountable between the rails of a railroad track;

openings in the ends of the switch box;

first and second switches located in the switch box;

two rods extending outwardly from inside the switch box through the openings, each one of said rods connected by means to each rail of the track when the alarm actuator is in its useful position between the rails;

means resiliently urging each rod outwardly;



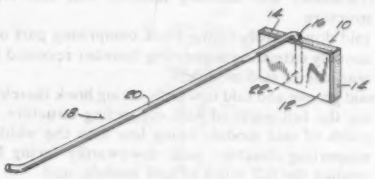
means linking each rod to one of the switches in the switch box so that when the rods move outwardly relative to each other by a first amount the first switch is tripped so as to operate a track wide gauge alarm means and when the rods move outwardly relative to each other by a second amount, larger than the first, the second switch is tripped so as to operate a track damage alarm means.

4,008,871

SHOWROOM WINDOW DISPLAY HANGER

Roger F. Rex, Hales Corners, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Jan. 15, 1976, Ser. No. 649,240
Int. Cl.² A47B *96/06;* **A47F** *5/00*
U.S. Cl. 248—205 A **5 Claims**



1. A display hanger for supporting a hanging banner on a support surface, said hanger comprising:

a base having a planar plate and two laterally spaced adhesive pads connected to said plate and each having exposed adhesive surfaces for attachment to the support surface, said plate and laterally spaced adhesive pads partially defining a supporting channel,

said supporting channel being completed by said support surface when said adhesive surfaces are attached thereto, and

a bracket having an extended arm and a leg generally perpendicular thereto, said leg being held within said supporting channel so that said extended arm extends laterally from said support surface for support of a display member therefrom.

4,008,872

MODULE SUPPORTING SYSTEM

Richard W. Thompson, Rte. 7 Box 7796, Port Madison, Bainbridge Island, Wash. 98110

Filed Oct. 8, 1975, Ser. No. 620,745
Int. Cl.² A47F *5/00;* **B65D** *31/00*
U.S. Cl. 248—224.2 **1 Claim**

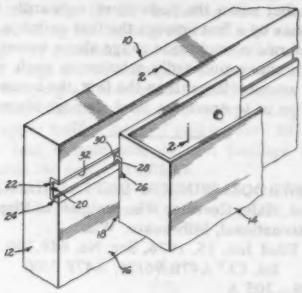
1. In a module supporting system, the combination of:

a. a supporting structure having a front side provided with a horizontal groove therein;

b. an upwardly facing hook within and extending longitudinally of said groove adjacent the bottom thereof and secured to said supporting structure, there being a longitudinal gap between said upwardly facing hook and the top of said groove;

c. a module having a rear side adapted to abut said front side of said supporting structure;

d. a horizontally extending, downwardly facing hook secured to and projecting rearwardly from said rear side of said module, said downwardly facing hook being complementary to and interengageable with said upwardly facing hook within said groove in said front side of said supporting structure, with said rear side of said module abutting said front side of said supporting structure, the height of said downwardly facing hook being less than the height of said gap to permit insertion of said downwardly facing hook through said gap, and into engagement with said upwardly facing hook, simply by moving said module



rearwardly into abutting relation with said supporting structure;

e. said downwardly facing hook comprising part of a horizontally extending supporting member recessed into said rear side of said module;

f. said groove and said upwardly facing hook therein extending the full width of said supporting structure, and the width of said module being less than the width of said supporting structure, said downwardly facing hook extending the full width of said module; and

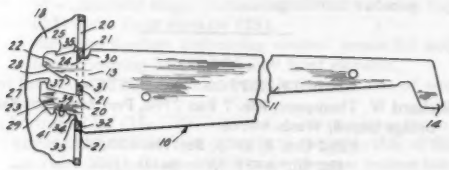
g. said module carrying adjacent the bottom thereof adjustable means engageable with said front side of said supporting structure to compensate for deformation of said front side of said supporting structure.

4,008,873

ANGULARLY ADJUSTABLE SHELF BRACKET

Vincent M. Travaglio, Rolling Meadows, and Michael L. Magnifico, Chicago, both of Ill., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 29, 1976, Ser. No. 653,292
Int. Cl.² A47G *29/02*; A47F *3/06*
U.S. Cl. 248—242 **9 Claims**



1. In a shelf supporting bracket comprising an elongated arm having a butt end from which extend a plurality of vertically spaced retaining fingers for supporting engagement with horizontal bars which separate vertically spaced openings in an upright supporting structure through which the fingers extend and with respect to which the bracket is adjustable to and between a plurality of different angular positions:

the uppermost of said fingers having on its upper edge spaced shoulders facing toward said butt end and engageable with a hole-separating bar to retain the bracket in a plurality of selective different angular positions relative to the supporting structure;

a lower finger having on its upper edge a shoulder facing toward said butt end and engageable with a bar to retain the bracket in another selective angular position relative to the supporting structure;

and said fingers having safety catch means on their lower edges comprising shoulders facing toward said butt end and engageable with the hole-separating bars for interim arresting of the bracket against dropping away from the supporting structure when effecting adjustment from one angular position to another;

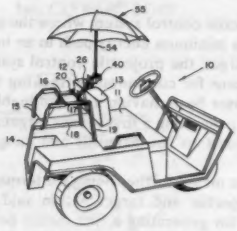
the lower of said fingers having a safety catch shoulder which is spaced farther from the butt end than a safety catch shoulder on the upper of said fingers.

4,008,874

UMBRELLA SUPPORTING BRACKET FOR MOTORIZED CARTS

John W. Conway, Jr., 15035 Westholm Court, Silver Spring, Md. 20906

Filed Oct. 23, 1974, Ser. No. 517,392
Int. Cl.² A01K *97/10*
U.S. Cl. 248—534 **4 Claims**



1. In combination, a canopy, a canopy supporting bracket, and a motorized cart equipped with a seating and storage area and wherein a pair of rearwardly extending horizontal bars are mounted on said cart, rearwardly of and directed away from said seating area, the improvement comprising, a forwardly inclined arm fixed to a transverse bar, one end of said bar provided with a fixed inturned lip engaging with one of said horizontal bars, the other end of said bar provided with a telescoping section having an inturned lip engaging with the other of said horizontal bars, securing said transverse bar to said rearwardly extending horizontal bars an adjustable bracket mounted on said forwardly inclined arm, said bracket including a two-part clamp engaging with the handle portion of said canopy and supporting the same in adjusted position over the seating area of said cart.

4,008,875

SEQUENCE VALVE FOR CLAMPING APPARATUS

John E. Olson, Portland, Oreg., and Richard D. Seaberg, Vancouver, Wash., assignors to Cascade Corporation, Portland, Oreg.

Filed Jan. 2, 1976, Ser. No. 646,401
Int. Cl.² F15B *13/06*
U.S. Cl. 251—63.4 **7 Claims**

6. In a control valve for operating in response to the pressure difference between a pair of fluid communication ports in the valve, where the valve includes

a valve body,

a valve spool mounted within said body for shifting between a pair of control positions, with said spool including first and second working surface areas on opposite sides

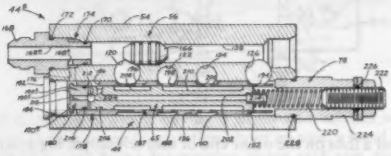
thereof on which pressure fluid may act to shift the spool toward its said two control positions,

biasing means acting on said spool yieldably urging the same toward one of its said control positions, and

means defining a pair of fluid passages in said body, one for communicating between one of said ports and said first working surface area, and the other for communicating between the other port and said second working surface area,

the improvement comprising:

means interposed between said one fluid passage and said first working surface area constructed to enable exposure to pressure fluid within said one fluid passage of only a



portion of said first working surface area with said spool in its said one control position, and constructed further to enable exposure of the full extent of said first working surface area to such pressure fluid with said spool shifted toward its said other control position; and

changeable-condition pressure-balancing means for said spool including means defining an openable-closeable fluid path which, with said spool in its said one control position, allows fluid communication between said second working surface area and a portion of said first working surface area which is different from said first-mentioned portion, and which blocks such communication with said spool shifted toward its said other control position.

4,008,876

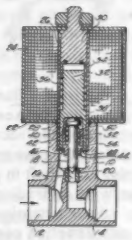
SOLENOID VALVE

Clifford F. Bastle, Milwaukee, Wis., assignor to The Singer Company, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,759

Int. Cl.² F16K *31/06*

U.S. Cl. 251—129 **3 Claims**



1. A solenoid valve comprising,

a housing having an inlet and outlet separated by a valve port,

a valve on the inlet side of the port movable relative to the port to control flow from the inlet to the outlet,

a coil mounted on the housing,

a core inside the coil and magnetized by the coil when the coil is energized,

an armature slidable inside the coil and having its working face spaced from the core when the valve is closed,

said valve having a lost motion connection to the armature with a positive limit stop at each end of the motion,

a return spring acting on the armature in a direction moving the armature to the valve closing position,

a spring acting on the valve and moving the valve to a position against one limit stop providing the maximum lost motion between the armature and the valve,

energization of the coil acting to initially move the armature towards the core against the weight of the armature and the compression force of both springs,

the lost motion between the armature and the valve being taken up upon impact of the valve against the other limit stop prior to the armature seating against the core whereby the increased available magnetic force and the kinetic energy of the moving armature act to unseat the valve before the armature seats against the core,

said valve spring acting to move the valve further from the port after the armature has seated against the core.

4,008,877

BUTTERFLY VALVE APPARATUS

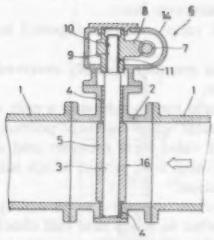
Masahiro Yasuoka, and Yoshitsugu Okada, both of Hirakata, Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 419,368, Nov. 27, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,411

Claims priority, application Japan, Nov. 30, 1972, 47-120382

Int. Cl.² F16K *31/44*

U.S. Cl. 251—249.5 **6 Claims**



1. A butterfly valve comprising:

a housing including a tubular portion for carrying fluid therethrough;

a rotatable valve shaft arranged to penetrate said tubular portion perpendicularly to the axis thereof, said valve shaft being held in sleeve bearings located adjacent to opposite walls of said tubular portion and further including a drive stem with a rectangular cross section;

a butterfly valve plate fixedly mounted on said rotatable valve shaft in said tubular portion;

a drive plate, having an aperture arranged to receive the drive stem of said valve shaft and further provided with gear teeth on part of its periphery; and

means for oscillating said drive plate the improvement wherein:

said drive plate has a rectangular means defining an opening including opposed longitudinal side dimensions which are perpendicular to the plane of said butterfly valve plate and transverse dimensions of said rectangular means defining the opening lies in planes parallel with said butterfly valve, said valve stem further including a stem portion of rectangular configuration complemental to said rectangular means defining the opening in said drive plate and having a smaller longitudinal dimension than said drive plate opening to thereby permit limited relative sliding movement of said complementally formed elements to thereby compensate for radial clearance in said bearings as well as to relieve pressure on the means motivating said drive plate.

4,008,878

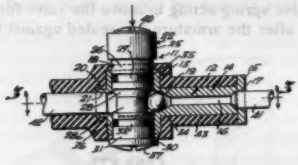
GAS CONTROL VALVE FOR GAS SHIELDED ELECTRIC WELDING TORCHES

Louis F. Himmelman, deceased, late of Upper Saddle River, N.J., by William F. Himmelman, executor, 28 Arrowhead Drive, Upper Saddle River, N.J.

Continuation of Ser. No. 218,303, Jan. 17, 1972, abandoned. This application July 8, 1974, Ser. No. 486,701

Int. Cl.² F16K *15/18, 1/14*

U.S. Cl. 251—257 **1 Claim**



1. A gas flow control valve for electric arc torches comprising:

a valve body member having substantially coaxial gas inlet and gas outlet passageways;

a bore in said valve body member transverse with respect to and communicating at opposite interior sides thereof with said gas inlet and said gas outlet passageways;

a frusto-conical passageway defining a valve seat recess at the inner end of said gas inlet passageway at the junction of said transverse bore;

a ball check valve member disposed in said valve seat recess;

a valve stem member slidably received within said transverse bore;

said valve stem member having a cam means comprising a frusto-conical cam surface portion coaxially formed along said valve stem member and defining a recess in said transverse bore within which said ball check is partially received;

said cam means operative upon axially shifting said valve stem member to move said ball check between unseated and seated positions with respect to said valve seat recess;

said valve stem member comprising a pair of transversely divided upper and lower valve stem sections, said upper section comprising said frusto-conical cam surface portion, and means for bolting said upper and lower valve stem sections together within said transverse bore;

said bolting means comprising a sleeve nut extending through axial bores in said upper and lower valve stem sections and a machine screw threaded in said sleeve nut;

means for securing said valve stem sections in end-to-end interfitting engagement comprising a short, tapered cylindrical key portion formed on one of said valve stem sections receivable in a complementary tapered circular recess in the other of said valve stem sections; and

means for sealing said upper and lower valve stem sections comprising resilient O-rings seated within annular grooves provided in said upper and lower valve stem sections.

4,008,879

CARPET STRETCHER

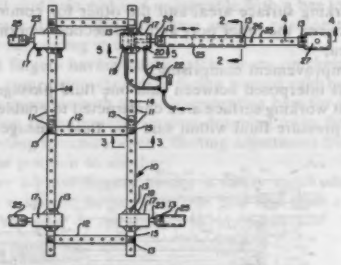
David R. Youngman, 39 E. Ravenwood Ave., Youngstown, Ohio 44507

Filed Mar. 4, 1976, Ser. No. 663,850

Int. Cl.² A47G *27/04*

U.S. Cl. 254—57 **9 Claims**

1. A carpet stretcher comprising a pair of spaced ladder-like rails, cross members joining said rails to form an elongated frame having a plurality of apertures therein, carpet engaging points on said rails, at least one pneumatic piston and cylinder assembly and means detachably mounting said piston and cylinder assembly on one of said rails of said frame at right angles thereto, at least one telescopic leg detachably secured to the piston of the pneumatic piston and cylinder assembly



and a foot on the other end of said telescopic leg and means on said foot for engagement with said carpet so that actuation of the pneumatic piston and cylinder will move the foot and the carpet engaged thereby relative to said frame.

4,008,880

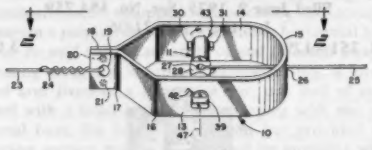
WIRE TIGHTENER

Michel Devis, 448 Geiger St., Berea, Ohio 44017

Filed July 7, 1975, Ser. No. 593,204

Int. Cl.² B66D *1/04*

U.S. Cl. 254—161 **17 Claims**



1. A wire tightener comprising a frame having substantially parallel sides, a shaft journalled between and through holes in the sides of said frame, means to secure a wire end to said shaft, projections on said shaft between and adjacent the sides of said frame maintaining said shaft in position, and a strike in said frame contiguous with and adjacent one of said holes cooperating with the adjacent projection to preclude said shaft from rotating in one direction past said strike, said strike including a cam surface and a stop surface, the latter extending generally normal to the side of the frame and generally radially of the adjacent hole, the sides of said frame being resiliently urged apart as the edge of the projection moves over said cam surface as the shaft rotates in the opposite direction.

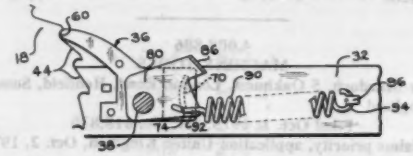
9. A wire tightening device comprising a frame including parallel sides, a shaft extending between said sides, means to secure a wire to said shaft, projections on said shaft adjacent the sides, and a cam strike in one of said sides cooperating with one of said projections to prevent said shaft from rotating in one direction, said frame being of sufficient resilience to permit said sides to move relative to each other slightly as said projection cams over said cam strike as said shaft rotates in the opposite direction.

4,008,881

PORTABLE WINCH RATCHET DOG

Karl J. Ross, Maumee, Ohio, assignor to American Gage & Manufacturing Co., Wauseon, Ohio

Filed Mar. 17, 1975, Ser. No. 558,644
Int. Cl.² A63B *61/04*
U.S. Cl. 254—164 **4 Claims**



1. In a portable winch having a drum and ratchet wheel mounted upon a frame for rotation about an axis, a hand lever pivoted upon said frame for rotation about said axis, tension transmitting means wound upon said drum, a releasable stop pawl pivotally mounted upon said frame engaging said ratchet wheel permitting unidirectional rotation of said drum, the improvement comprising a ratchet dog, a pivot pivotally mounting said ratchet dog upon said hand lever for pivoting between an operative position engagable with said ratchet wheel and an inoperative position clearing said ratchet wheel during pivoting of said hand lever about said axis, an elongated closed spring anchor slot defined on said dog having spaced first and second spring receiving portions, a spring anchor defined on said hand lever, said slot being located between said pivot and said spring anchor, a tension spring having a first end directly slidably received within said slot and a second end attached to said anchor, and a spring shifter comprising a member pivotally mounted on said pivot directly engaging said spring first end adjacent said slot selectively shifting said spring first end within said slot between said first and second spring receiving portions, an opening defined in said spring shifter member receiving said spring first end, said anchor, spring receiving portions and pivot being so related that positioning said first spring end at said first spring receiving portion misaligns said spring first end from a straight line relationship between said pivot and spring anchor to produce a biasing force which pivots and maintains said dog at said operative position and positioning said first spring end at said second spring receiving portion misaligns said spring first end from a straight line relationship between said pivot and spring anchor to produce a biasing force which pivots and maintains said dog at said inoperative position.

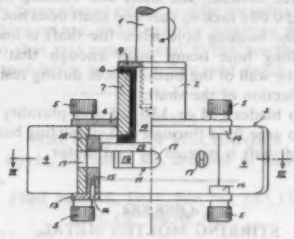
4,008,882

MIXING UNIT FOR MIXING AND/OR TREATING FLUID MATERIALS

Povl Jørgen Jørgensen, Vedbaek, Denmark, assignor to Rotostat I/S, Copenhagen, Denmark

Filed Mar. 17, 1975, Ser. No. 559,031
Claims priority, application Denmark, Mar. 26, 1974, 1662/74
Int. Cl.² B01F *15/00, 7/02*
U.S. Cl. 259—2 **4 Claims**

1. A mixing stirrer for mixing and treating liquid materials after being placed inside a container containing said liquid materials, comprising an outer housing comprising substantially a right cylindrical sidewall and two flat circular end plates with the sidewall defining openings for passage of said liquid materials and having disposed exteriorly thereof at least one outwardly radially extending flat paddle-like protrusion, a driven rotor having outwardly extending impeller blades mounted within said housing for rotation relative to said housing on a drive shaft adapted to be connected to a driving means with the axes of said right cylindrical sidewall, said rotor drive shaft, and said rotor being coaxial, said housing being mounted for free rotation relative to said rotor, as well as to said container, and said rotor acting to direct the liquid materials to be treated outwardly through said openings in



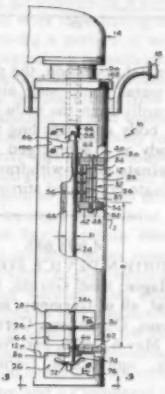
said housing sidewall into an area adjacent said protrusions whereby the materials will be acted on by said protrusions and the rotation of said housing in said liquid material will be restrained.

4,008,883

BLENDER

Robert Frutos Zubieta, 1101 Aviation Blvd., Hermosa Beach, Calif. 90254

Filed June 11, 1975, Ser. No. 585,853
Int. Cl.² B01F *5/16, 7/26*
U.S. Cl. 259—108 **2 Claims**



1. A blender comprising:
a tube (**12** or **119**) having upper and lower portions;
a shaft (**24** or **122**) positioned in said tube to extend substantially axially therealong;
a motor (**14**) coupled to said shaft to turn it in a predetermined direction;
a bearing assembly (**32**) including a plurality of bearings mounted on said tube and rotatably supporting said shaft;
said tube having a first plurality of circumferentially spaced openings (**30** or **125**) near the lower end thereof and a second plurality of circumferentially-spaced openings (**28** or **123**) located above said first openings;
a plurality of blades (**24** or **126 – 130**) mounted on said shaft, some of said blades mounted at the level of said first plurality of openings in said tube and some of said blades mounted at the level of said second plurality of openings in said tube;
a bushing support (**62** or **118**) mounted in said tube between said first and second openings;

a stabilizing bushing (**60** or **114**) mounted on said bushing support and having a bushing hole (**66** or **114h**) through which said shaft extends, said bearing assembly holding said shaft so it extends through the center of said bushing hole and said bushing hole being of a size which provides a clearance between the shaft and bushing of between 0.016 and 0.064 inch so that said shaft does not touch the walls of the bushing hole when the shaft is undeflected, said bushing hole being small enough that the shaft touches the wall of the bushing hole during resilient sideward deflection of the shaft;

at least two blades (**74** or **130**) of said plurality of blades shaped to urge fluid through said stabilizing bushing hole when said shaft is rotated by said motor.

4,008,884

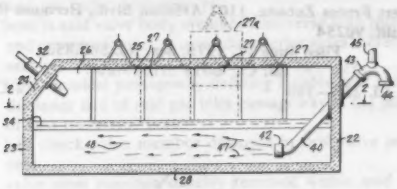
STIRRING MOLTEN METAL

Nigel Patrick Fitzpatrick, Kingston, Canada; James Neville Byrne, Banbury, England, and Angus James MacDonald, Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed June 17, 1976, Ser. No. 697,113

Int. Cl.² C22B *9/02*

U.S. Cl. 266—233 **34 Claims**



1. In a molten metal operation, the procedure of stirring a body of molten metal comprising alternately withdrawing molten metal upwardly from the body in a confined space to a level above the body and expelling the withdrawn molten metal into the body as a submerged high velocity jet, and repeating said alternate metal-withdrawing and metal-expelling steps to effectuate continued stirring in the body.

4,008,885

HOLDDOWN DEVICE FOR SHEARS

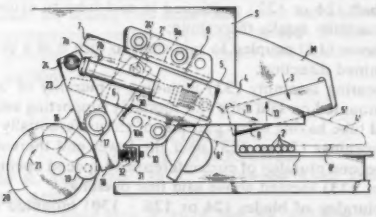
Albert Einhaus, Hagen; Rudi Gürnth, Herbede, and Siegfried Klaus, Ennepetal, all of Germany, assignors to Firma Paul Ferd. Peddinghaus, Gevelsberg, Germany

Filed May 6, 1976, Ser. No. 683,744

Claims priority, application Germany, May 9, 1975, 2520585

Int. Cl.² B25B *1/08*

U.S. Cl. 269—162 **4 Claims**



1. A holddown device for shears mounted on a support structure including a trapezoidal beam guided on inclined tracks set laterally parallel to the shears opening, means for moving said beam between a starting position where it is out of engagement with the material it is to hold in place during shearing and an operating position where it is in engagement therewith, said means including a two-armed lever pivotally mounted relative to said support structure and disposed adjacent said beam, a tension spring situated in the longitudinal direction of said beam and connected at one end to said beam and at its other end to one arm of said lever, and cam and second spring means constructed and arranged to engage the other arm of said lever whereby the beam can be resiliently moved into and out of engagement with the material to be sheared.

4,008,886

MACHINE TOOLS

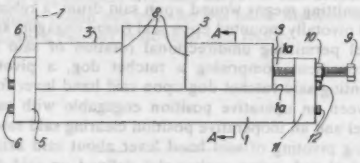
Peter Murdoch, 5 Oakhurst, London Road, Henfield, Sussex, England

Filed Oct. 1, 1975, Ser. No. 618,830

Claims priority, application United Kingdom, Oct. 2, 1974, 42689/74

Int. Cl.² B25B *1/24*

U.S. Cl. 269—266 **8 Claims**



1. A variable profile vice jaw face member comprising:

a. an elongated base member including a first insert supporting precision tooled surface lying in a plane extending generally transverse to the direction of closing of the jaw face member, the open area immediately in front of the said insert supporting surface defining generally an inset supporting area, the base member extending longitudinally transversely of the direction of opening and closing of the jaw face with the insert supporting area generally facing the direction of closing of said jaw face member;

b. a precision tooled groove area in said insert supporting surface extending longitudinally of the base member and transversely of the direction of closing of the jaw face member;

c. end plates secured to and spaced along the base member blocking the insert supporting area in an endwise sense;

d. at least one insert member disposed in the insert supporting area between the end plates, each insert supporting member having a complementary formed base engaging surface engaging the insert supporting surface of the base member, including the groove area, in contiguous relationship, and a work engaging surface generally facing the direction of closing of the jaw face member; and

e. locking means secured to one of said end plates for removably securing each insert member between the end plates within the insert supporting area of the base member.

4,008,887

APPARATUS AND METHOD FOR THE FOLDING OF MATERIAL TO BE PACKAGED

Oskar Karolyi, Boll, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Feb. 11, 1974, Ser. No. 441,320

Claims priority, application Germany, Feb. 10, 1973, 2306653

Int. Cl.² B65H *45/00*

U.S. Cl. 270—61 R **24 Claims**

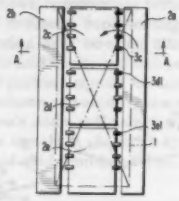
22. Apparatus for folding material to be packaged comprising:

a plurality of folding flap means,

folding flap moving means for sequentially moving said flap means to effect folding of material placed on said flap means,

gripper means associated with at least one of said flap means, said gripper means being movable between a gripping position corresponding to gripping of material against a respective flap means and a non-gripping position,

and gripper control means for controlling movement of said gripper means between said gripping and non-gripping



positions during folding of material by said flap means and flap moving means,

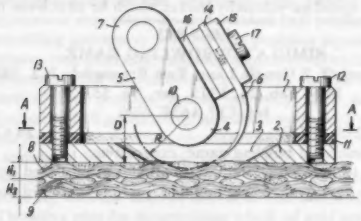
wherein said gripper means are attached to rotatable gripper support shafts, and wherein said gripper control means includes flexible shafts which are attached to respective ones of said support shafts, and rotatable cam disks which are sequentially rotated in predetermined relationship to movement of the flap means, said cam disks being drivingly connected to said flexible shafts for imparting rotation to same.

4,008,888

DEVICE FOR THE TRANSPORT OF INDIVIDUAL PIECES OF FABRIC IN THE AUTOMATIC MANUFACTURE OF PRODUCTS THEREFROM

Costantino Vinciguerra, Florence, Italy, assignor to Nuovo Pignone, S.p.A., Florence, Italy

Filed Feb. 20, 1974, Ser. No. 444,117
Claims priority, application Italy, Feb. 20, 1973, 20575/73
Int. Cl.² B66C *1/58*
U.S. Cl. 271—18.3 **2 Claims**



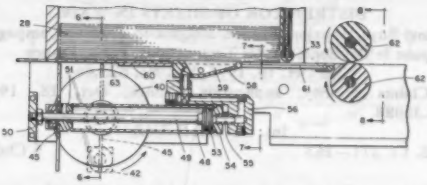
1. Apparatus for the automatic manufacture of articles from fabric by moving cut individual pieces of a set to a work station at which the pieces are sewed to each other, wherein the improvement comprises: a movable hollow frame, a flat plate adapted to be forced downwardly against the upper surface of a piece of fabric and having a centrally disposed opening, a connection between the plate and the frame, wherein said connection between the plate and frame is adjustable and comprises, a flexible gasket located between the lower face of the frame and the upper face of the plate, and a set of plate adjustment screws extending through the frame and the gasket and engaging the plate so that rotation of said plate adjustment screws will vary the distance between the plate and the frame, thereby changing the location of said arc, an elongated oscillatory needle holder having its lower end supported by said frame along an axis of rotation located above said opening in the plate, a needle having a curved sharply tapered lower end and a stem, a connection between said stem and needle holder at a point above said lower end thereof whereby oscillation of said needle holder will cause the sharply tapered end of the needle to swing through said opening along an arc, and means for adjusting the location of said arc so that said tapered end of the needle is caused to penetrate said fabric to a predetermined depth.

4,008,889

VACUUM FEED MECHANISM

Walter D. Ayres, Burbank, Ill., assignor to Redco, Inc., Chicago, Ill.

Filed June 16, 1975, Ser. No. 587,129
Int. Cl.² B65H *3/12*
U.S. Cl. 271—99 **3 Claims**



1. A pneumatic feed mechanism for removing one article at a time from the bottom of a stack of articles, the improvement comprising:

an article receptacle for positioning a stack of articles on a work table and said work table having an elongated opening therein and having a portion of said opening at the bottom of said receptacle; a vacuum shuttle positioned in said elongated opening and reciprocable therein to engage and move the bottom article from said stack; a feed gate positioned adjacent to said opening and having a movable tongue and roller assembly for guiding articles on said table; a drive mechanism coupled with said vacuum shuttle and said drive mechanism having a rotatable drive member coupled to a pivotally attached slide block; pneumatic means having a slider-drive coupled with the drive member and having piston means and cylinder means; one of said piston-cylinder means being movable with respect to the other of said piston-cylinder means to create an operating vacuum; and said vacuum shuttle having means coupled to said pneumatic means whereby said shuttle moves in unison with the movable portion of said pneumatic means, and said pneumatic means including a fixed piston rod and a cylinder reciprocally movable with respect thereto; and a chambered connecting fitting for transmitting vacuum interconnecting the movable cylinder with the vacuum shuttle.

4,008,890

METHOD AND APPARATUS FOR TRANSPORTING MATERIALS

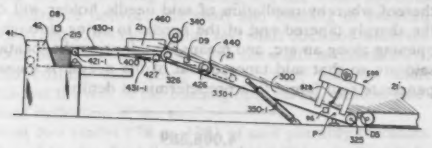
William F. Pulda, Piscataway, N.J., assignor to Vanguard Machinery Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 545,038, Jan. 29, 1975, Pat. No. 3,982,750. This application June 5, 1975, Ser. No. 574,954
The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.
Int. Cl.² B65H *5/24*
U.S. Cl. 271—151 **11 Claims**

1. The method of transporting and reorienting a stack of materials which comprises the steps of:

a. conveying the stack to a prescribed position on and by one driven feed conveyor;

b. pivoting another driven feed conveyor to a prescribed angular position relative to the one conveyor;
c. tilting said stack and letting it fall freely against the other conveyor to simultaneously upset and shingle said stack;



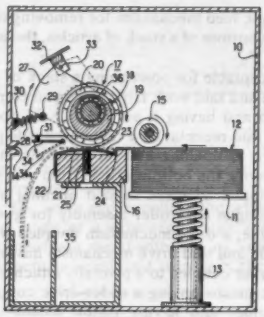
d. positioning said other conveyor for the feed of the upset stack therefrom;
e. substantially uniformly increasing the shingle of said stack.

4,008,891

DISTRIBUTOR OF SHEETS IN WADS

Henri Buys, Arpajon, France, assignor to Transac-Compagnie pour le Development des Transactions, Paris, France

Filed Oct. 16, 1975, Ser. No. 623,069
Claims priority, application France, Oct. 18, 1974, 74.35088
Int. Cl.² B65H 7/12
U.S. Cl. 271—263 **5 Claims**



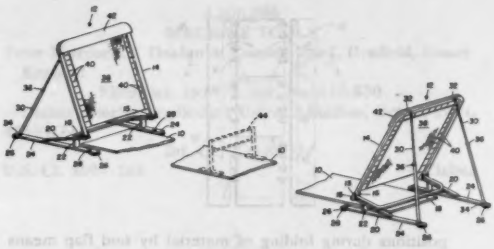
1. In a machine for distributing individual sheets from a stack comprising a receptacle for the stack, means for feeding the sheets one by one through an orifice in the receptacle, and detecting means for detecting the simultaneous presence of a plurality of sheets in the vicinity of the orifice and upstream therefrom, said detecting means comprising a support having a substantially planar top portion on which pass sheets extracted from the stack, an eccentric wheel, a stationary shaft rotatably supporting said wheel, said shaft extending parallel to the planar top portion and perpendicular to the direction of movement of the sheets, said wheel comprising a first ball bearing installed on said shaft, an eccentric ring mounted on said ball bearing, and a second ball bearing surrounding said eccentric ring, said wheel being arranged in the vicinity of the planar portion of the support but spaced therefrom such that the planar portion is spaced from the wheel by a distance at least equal to the thickness of one sheet and less than the thickness of two sheets, first means acting on the wheel for keeping it in a fixed angular position where there is, at most, one sheet between the support and the wheel, a vertical line passing through the center of said wheel in said fixed angular position passing through the center or slightly downstream of said stationary shaft in relation to the direction of movement of the sheets, and second means for detecting rotation of said wheel for diverting the passage of the sheets to the orifice, said rotation taking place when a plurality of sheets arrive simultaneously between the wheel and the support.

4,008,892

APPARATUS FOR REBOUND RUNNING

George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation

Continuation of Ser. No. 338,190, March 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 262,679, June 14, 1972, abandoned. This application Aug. 7, 1975, Ser. No. 602,683
Int. Cl.² A63B 5/08
U.S. Cl. 272—100 **10 Claims**



1. A combination for use with a confined floor area for running a first distance longer than a second distance between two locations within said area by reciprocally traversing the second distance a plurality of times, the combination comprising: an unsuspended running surface, means on said surface defining a substantially rectilinear running lane, the lane having two locations thereon spaced apart longitudinally thereof and adapted to be reciprocally traversed by a runner; a backstop disposed at at least one of said locations, the backstop including a flexible panel and a frame surrounding margins of the panel, the panel being suspended within the frame by resilient means attached to and between the frame and said panel margins; and means supporting the frame against movement relative to the lane and with a face of the panel disposed in an upright position transversely of the lane, the panel being so angled with the running surface that when said face thereof is struck by an upright portion of the body of a runner running in one direction along the lane toward the backstop, the runner is thereupon bodily rebounded therefrom back along the lane in the opposite direction toward the other of said locations at a speed substantially that at which he struck the panel.

4,008,893

SIMULATED BOWLING GAME

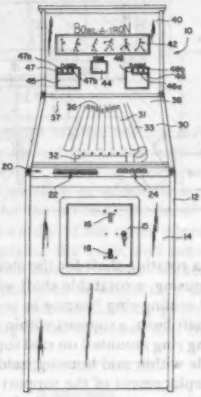
Mark Yoseloff, 8 Candle Lane, East Brunswick, N.J. 08816

Filed Feb. 26, 1975, Ser. No. 553,361
Int. Cl.² A63F 7/06
U.S. Cl. 273—85 R **24 Claims**

1. A simulated bowling game, comprising:
means to provide a simulated ball and a simulated bowling alley having a starting line and a set of simulated bowling pins;
random signal means for generating random binary bits;
ball path selection means which comprises an initial ball position selector, ball position encoder means responsive to said initial ball position selector for providing an initial ball position signal, a ball direction selector, and ball direction encoder means responsive to said ball direction selector providing a ball direction signal; wherein said ball position encoder means includes means for generating a horizontal ball displacement signal in response to said ball direction signal and said random signal means; and adder means for adding said initial ball position signal and said horizontal ball displacement signal to provide a succession of horizontal ball position signals;
ball position means for simulating movement of said simulated ball down said simulated bowling alley from said starting line to said set of simulated bowling pins, wherein said ball position means includes horizontal ball position

means and vertical ball position means, said horizontal ball position means computing a horizontal position for said ball in response to said ball path selection means and said random signal means for each of a plurality of positions along said bowling alley, and wherein said vertical ball position means providing successive vertical ball position signals, said ball position means being responsive to said ball path selection means and said random signal means for determining the path of the ball;

display means for displaying the position of said simulated ball as it moves down said simulated bowling alley, said display means including a plurality of lamps arranged in a plurality of rows, representing vertical ball position, and a plurality of columns, representing horizontal ball position, simulating said bowling alley, and circuit means responsive to said horizontal ball position signals and said vertical ball position signals for successively energizing a lamp in a column selected by one of said horizontal ball position signals and a row selected by one of said vertical ball position signals in sequence to display the simulated movement of said simulated ball down said simulated



bowling alley from said starting line to said set of simulated pins;

step generator means for synchronizing said horizontal ball position means and said vertical ball position means, said step generator means providing step signals defining successive step intervals and vertical ball position means providing successive vertical ball position signals in successive step intervals, said step signals synchronizing said horizontal ball displacement generator means with said vertical ball position means whereby each successive horizontal ball position signal will coincide with a vertical ball position to signify horizontal and vertical positions of a simulated ball in said simulated alley;

pin disposition means enabled by a said step signal corresponding with the time of arrival of said ball with said set of bowling pins for determining which of said set of bowling pins will fall; and

random number generator means providing a random number signal at said time of arrival, and wherein said pin disposition means is responsive to said horizontal ball position signal and said random number signal provided upon the enablement of said pin disposition means.

4,008,894

RAILROAD TEETER SWITCH GAME

David L. Renner, Rte. 1, Wallace, Kans. 67761

Filed July 21, 1975, Ser. No. 597,439

Int. Cl.² A63F *7/04, 9/08*

U.S. Cl. 273—110 **5 Claims**

1. A railroad teeter switch game using colored roller balls, the individual balls representing a railroad engine, a railroad caboose, and other railroad cars, the game comprising:

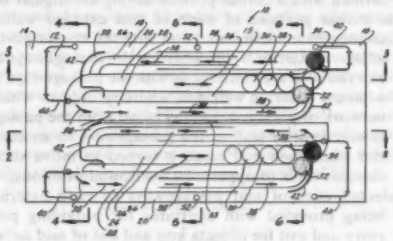
colored roller balls;

a game board;

pivot means attached to said board for tilting said board;

a main channel in said board, said main channel parallel to the sides of said board, said main channel receiving said roller balls for rolling therein;

return channels in said board, said return channels positioned on either side of said main channel and parallel thereto, said return channels attached at both ends to said main channel for receiving and returning the roller balls to said main channel; said return channels are inclined in opposite direction so that said game board when tilted in



one direction one of said return channels will receive one of said rollers balls from said main channel while said other return channel will return another of said roller balls to said main channel, when said game board is tilted in the other direction said other return channel will receive one of said roller balls from said main channel while said return channel will return another of said roller balls to said main channel; and

a plurality of switches attached to said board, said switches positioned at each end of said main channel to control the flow of the roller balls into said return channels as said game board is tilted;

said main channel repesenting a railroad track, said return channels repesenting railroad return tracks.

4,008,895

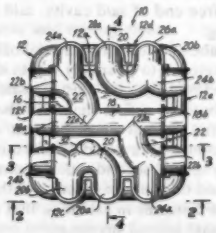
MAZE GAME

Lawrence L. Reiner, Woodbury, N.Y., and John P. McNett, Short Hills, N.J., assignors to Lawrence L. Reiner, Woodbury, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,256

Int. Cl.² A63F *7/04*

U.S. Cl. 273—113 **15 Claims**



1. Maze game comprising

a plurality of interconnected exterior walls forming a first three dimensional body of polyhedron shape,

a plurality of interconnected interior walls forming a second, similarly-shaped three dimensional body of smaller size than said first three dimensional body and disposed within the latter,

said interior and exterior walls having planar surfaces forming similar polyhedrons, with the planar surfaces of said interior walls underlying the planar surfaces of the exterior walls and being disposed parallel thereto to define a uniform spacing between said surfaces,

each of said exterior walls being formed with a network of elongated channels projecting outwardly of the planar surface thereof and in a direction away from the underlying interior wall,

said channels forming with said interior walls a corresponding network of passageways, whereby an object having dimensions greater than that of said uniform spacing can move only along paths defined by said passageways,

each of said channels having end portions extending beyond the edges of the exterior wall containing said channel and formed with a corner portion having an angular bend,

the corner portions of each of said exterior walls being connected in communication with the corner portions of adjacent exterior walls, whereby the passageways in each exterior wall are continuous with the passageways in each adjacent exterior wall and whereby objects within said network of passageways may move from the passageways in one exterior wall to the passageways in another exterior wall when said maze is turned to move successive exterior walls to uppermost horizontal positions,

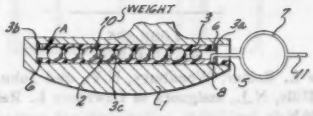
selected ones of said passageways of each exterior wall being provided with apertures for providing points of entry and exit for objects into and out of said network of passageways, whereby objects within said network of passageways may move through said passageways and escape through said apertures to the exterior of said maze when said maze is selectively turned to change the orientation of said exterior walls.

4,008,896

WEIGHT ADJUSTOR ASSEMBLY

Ambrose L. Gordos, 4301 E. 2nd, No. 1E, Long Beach, Calif. 90803

Filed July 10, 1975, Ser. No. 594,635
Int. Cl.² A63B *53/04*
U.S. Cl. 273—171 **3 Claims**



1. A weight adjuster assembly for use on a golf club head having an elongate cavity therein that is substantially parallel to the striking surface of said head and a closure that removably engages the free end of said cavity, said weight adjuster assembly including:

a. an elongate tube of a resilient material of such length and external diameter as to fit snugly within said cavity when the latter is closed by said closure, said tube having a longitudinal bore of a first diameter therein, said tube having first and second ends, at least one radial first opening adjacent said first end of said tube, a plurality of longitudinally spaced second radial openings of a second diameter in said tube, and a plurality of third radial openings of a third diameter in said tube that are transversely aligned with said second openings;

b. a plurality of rigid weight balls, each of said balls of a fourth diameter that is greater than said first and second diameters, and said weight balls capable of being forced inwardly through said second openings into said bore to be frictionally gripped by said resilient tube to occupy a fixed longitudinal position therein; and

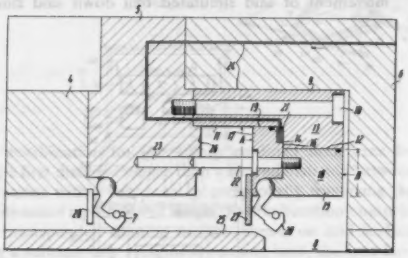
c. a tool that includes a curved member, an elongate pin secured to said curved member, said hook when said closure is removed from said head capable of engaging said first opening to permit said weight adjuster to be withdrawn from said cavity, and said pin after said weight adjuster is removed from said cavity capable of being moved radially through said third openings to force unwanted of said weight balls from said bore outwardly through said second openings.

4,008,897

SEALS FOR ROTATING SHAFTS, ESPECIALLY FOR STERN TUBE SEALS FOR SHIPS

Donald Wentworth, Tufnell Park, England, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel Diedrichsdorf, Germany

Filed Sept. 23, 1974, Ser. No. 508,619
Claims priority, application Germany, Sept. 28, 1973, 2348816
Int. Cl.² F16J *15/54*
U.S. Cl. 277—9 **2 Claims**



1. A seal for a rotating shaft for the stern tube seal of a ship comprising a housing, a rotatable shaft within said housing, at least one radial sealing ring bearing in sealing manner against the shaft or a shaft bush, a support within said housing, at least one spare sealing ring mounted on said support, guides for said support movable within said housing, said support being movable by axial displacement of the support from a reserve position into a working position on the shaft, the support together with at least one spare sealing ring being movable in said guides on parts of the housing of the seal, the support of the spare sealing ring comprising on one side an annular shoulder which is supported on its outer surface for sliding movement in a supporting part of the housing, the support of the spare sealing ring being provided on its opposite side with guiding means being shiftable in a stationary part of the housing of the seal, the support on one side being provided with a chamber for receiving a pressure medium, especially a hydraulic medium, for moving the support and the spare sealing ring into a working position on the shaft, the said guiding means on one side of the support bearing one spare ring being formed by a number of sliding rods distributed around its circumference which are guided so as to slide in recesses in a stationary part of the housing of the seal.

4,008,898

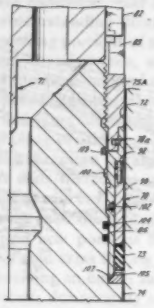
WELL APPARATUS

James M. Weldon, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 480,754, June 19, 1974, abandoned. This application Nov. 13, 1974, Ser. No. 523,367
Int. Cl.² F16J *15/10*
U.S. Cl. 277—116.2 **22 Claims**

1. Well apparatus, comprising an outer member having a vertical cylindrical bore therein, an inner member having a first cylindrical surface thereabout which is disposable concentrically within the bore of the outer member, means providing a second cylindrical surface about the inner member which is of larger diameter than the first cylindrical surface, a

seal ring of elastomeric material having its inner diameter close about the first cylindrical surface, means providing a first shoulder about the first cylindrical surface, means providing a second shoulder about the second cylindrical surface and facing the first shoulder, the outer edges of said shoulders being substantially vertically aligned with the outer diameter of said seal ring, means connecting said first and second shoulder-providing means against vertical movement with respect to said second surface-providing means to dispose said shoulders close to the ends of said seal ring, said connecting means



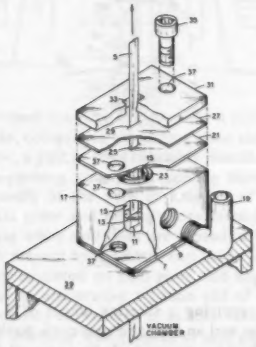
being releasable to permit relative vertical movement of first and second shoulder-providing means with respect to said second cylindrical surface-providing means, so as to stretch said seal ring into a position in which its inner diameter is sealably engaged about the second cylindrical surface and its outer diameter is outwardly of the outer edges of said shoulders for sealably engaging the bore, and means for limiting said relative movement thereof so as to locate said first and second shoulders in positions in which they are spaced from one another a distance not substantially greater than that of the end-to-end spacing of the stretched seal ring.

4,008,899

SEAL FOR PERMITTING TRANSFER OF TAPE FROM ONE PRESSURE REGION TO A REGION OF SUBSTANTIALLY DIFFERENT PRESSURE

H. Kennon Carter, and Ronald L. Mlekodaj, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 27, 1976, Ser. No. 647,678
Int. Cl.² F16J *15/40*
U.S. Cl. 277—135 **2 Claims**



1. A vacuum seal for permitting passage of an elongated flexible tape between a vacuum chamber and a region of substantially higher pressure comprising:

a first elastomer sheet disposed over an opening in a wall of said vacuum chamber and having a slitted opening therethrough aligned with said opening in the wall of said vacuum chamber for allowing restricted passage of said elongated tape therethrough from said vacuum chamber;

a housing having an inner opening therethrough forming an upright intermediate pressure chamber having its lower end formed and sealed by said first elastomer sheet, said chamber containing a low vapor pressure sealing liquid partially filling said intermediate pressure chamber and contacting said first elastomer member so that said elongated tape passes through said liquid entering said chamber through said opening in said first elastomer sheet;

a second elastomer sheet forming the upper end of said intermediate pressure chamber and sealing said intermediate pressure chamber from said higher pressure region and having a slitted opening therethrough for restricted passage of said elongated tape from said intermediate pressure chamber into said higher pressure region; and

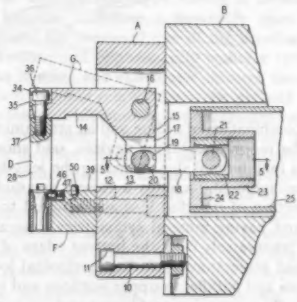
clamping means for sealably clamping said elastomer sheets at opposite ends of said housing in a sandwiched arrangement against said vacuum chamber wall, thereby forming sealed enclosures of said intermediate chamber ends.

4,008,900

INDEXING CHUCK

Mushie Khoshaba, Elk Grove Village, Ill., assignor to John Freedom, Chicago, Ill., a part interest

Filed Mar. 15, 1976, Ser. No. 666,965
Int. Cl.² B23B *31/34*; B23Q *17/18*
U.S. Cl. 279—5 **10 Claims**



1. An indexing chuck assembly which includes, in combination,

raising means,

means to actuate said raising means,

a chuck block, a workpiece mounting passageway in said chuck block,

fastening means at the top of said chuck block to engage said raising means,

a cammed shaft extending downwardly at the bottom of said chuck block, said shaft having a plurality of grooved cam yokes, a communicating and reversing one-way cam path formed with adjoining yokes, each yoke formed by angular grooves joined in a Y configuration, alternating Y configurations being reversed relative to each other and adjoining yokes having common angular grooves, each angular groove having a straight branch substantially parallel to the axis of the shaft and an angular branch forming an angle with said axis of the shaft, the angular branch of a first groove forming a junction with the second groove in a yoke, a one-way cam drop at said junction into an upward cam path of the second groove, a bottomed stop at the end of the straight branch, the

angular branch of the second groove forming a junction with a first groove of an adjoining yoke, a one-way cam drop at said junction into a downward cam path, the bottom stop in one yoke being a rest stop towards the top of the shaft, and the bottomed stop in the adjoining yoke being a reverse stop towards the bottom of the shaft,

a flat table member to support the bottom of the chuck block,

a bore in said table member to rotatably receive said cam shaft,

a cam follower in said table member and communicating with the said bore, and

means urging said cam follower into sliding engagement with the angular cammed grooves

whereby raising said chuck body imparts rotation to said chuck body as the bearing element follows a reversing cam path from a rest stop position, through a reverse stop position, and a rest stop position in the adjoining yoke.

4,008,901

TRIPLE SKATE ATTACHMENTS

John L. Conn, Maple Terrace Drive, Apt. 14, Corbin, Ky. 40701

Filed June 11, 1975, Ser. No. 586,086
Int. Cl.² A63C *17/18*
U.S. Cl. 280—7.13 **3 Claims**

1. The combination of a shoe and an attachment secured to the shoe for mounting various devices, said shoe including a sole with a longitudinal slot extending the length of the shoe, and said attachment includes a raised longitudinal vertical channel section of inverted U-shape adapted to fit snugly in said slot and having integral symmetrical lateral projections extending transversely from the bottom edges of said channel section, said projections including horizontal lower portions spaced from and parallel to upper portions and vertical members integrally connecting said upper and lower portions, said attachment having a slot, defined by inner edges of the lower portions, vertically aligned with said sole slot, and wherein each of said various devices includes a T-shaped upper locking member comprising a vertical web and symmetrical lateral horizontal wings, the web extending vertically above said wings to be snugly received in the channel section and vertically below said wings to engage the inner edges and be received in said attachment slot, and the wings engage the upper and lower portions of said projections.

4,008,902

STOCK TRAILER

Terry A. Dill, Keota, Iowa, assignor to Fairfield Engineering and Manufacturing Company, Fairfield, Iowa

Filed Jan. 29, 1976, Ser. No. 653,297
Int. Cl.² B62D *33/08*
U.S. Cl. 280—43.23 **6 Claims**

1. A stock trailer towable by a tractor comprising:

a. a portable frame,

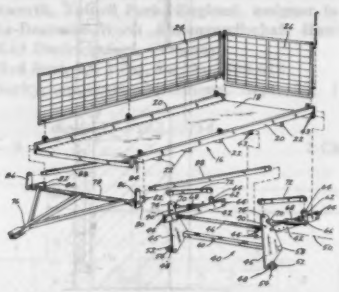
b. hitch means connecting the front end of the portable frame to the tractor,

c. a lift frame assembly including a pair of lift arms arranged at opposite sides of the portable frame, each lift arm having a ground engageable portion intermediate the ends thereof,

d. pivot means supporting the lift arms adjacent one of the ends thereof on said portable frame for pivotal movement about a common axis extended transversely of the portable frame,

e. a ground wheel rotatably supported at the other end of each lift arm,

f. levelling means for said portable frame movably interconnected to said hitch means and to said lift arms for levelling movement in response to a pivotal movement of said lift arms, and



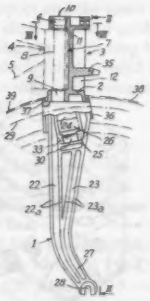
g. means for pivotally moving said lift arms to first positions extended longitudinally of the portable frame wherein the portable frame rests on the ground, said ground engageable portions are in ground engagement, and said ground wheels are without load so that on initial pivotal movement of the lift arms to second upright positions therefor an upward movement of the portable frame is initiated by the lifting action applied at said pivot means by the fulcrum support of the lift arms on said ground engageable portions.

4,008,903

FORK FOR STEERING WHEEL OF VARIOUS CYCLES

Louis Maurice Ramond, 28, rue de la Baume, 42100 Saint-Etienne, France

Filed Mar. 25, 1975, Ser. No. 561,835
Claims priority, application France, Mar. 29, 1974, 74.11908
Int. Cl.² B62K *21/02*
U.S. Cl. 280—279 **8 Claims**



1. A fork for receiving a steering wheel of a cycle, said wheel having a rim and an axle and said cycle having a frame, a handlebar and braking means including oppositely disposed brake jaws, each jaw having a brake pad for engagement with a side of said rim, said fork having a central portion which has

a transverse portion which extends transversely to the plane of the wheel and a pair of spaced portions extending downwardly from the transverse portion and parallel to and on opposite sides of the plane of said wheel to thereby overlie said wheel in spaced relation to the periphery and sides of said wheel when it is received in said fork, and having a stock portion extending upwardly from and integral with said central portion, said stock portion having bearing means substantially co-axial with a pivot axis in said plane for pivotally engaging said frame and having handlebar support means for supporting mounting means for said handlebar, said fork also having a pair of spaced apart arms extending downwardly from said spaced, downwardly extending portions of said central portion for receiving said wheel therebetween, each of said arms comprising a pair of arm portions integral with and extending downwardly from said spaced, downwardly extending portions of said central portion and lying substantially in a plane substantially parallel to said plane of said wheel, said arm portions being spaced apart in the direction parallel to said plane of said wheel at the upper ends thereof at said spaced, downwardly extending portions of said central portion and converging and being integral with each other at the opposite, lower ends thereof, each of said arm portions being U-shaped in cross-section and each of said arms having an opening at the lower end thereof for receiving an end of said axle and having means adjacent said spaced, downwardly extending portions of said central portion for receiving and mounting one of said brake jaws intermediate the spaced apart portions of said arm portions for engagement of said pad on said jaw with said rim, and at least said arms and said central portion being made of a plastics material.

4,008,904

FIFTH WHEEL COUPLING

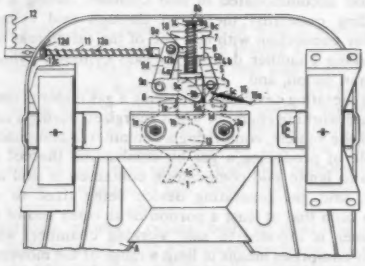
Philip Morey Davies, Potters Bar, England, assignor to Davies Magnet Works Limited, Ware, England

Filed Aug. 29, 1975, Ser. No. 608,979

Claims priority, application United Kingdom, Sept. 10, 1974, 39467/74

Int. Cl.² B62D *53/10*

U.S. Cl. 280—435 **7 Claims**



1. A fifth wheel coupling for coupling a towing vehicle to a trailer king pin, comprising a coupling plate mountable on said towing vehicle, a pair of jaws rotatably mounted on said plate and having opposing king pin receiving recesses with their centres forwardly of the axes of rotation of said jaws with respect to said plate and having faces forming a rearwardly directed recess when said jaws are closed, a locking plunger movable with respect to the plate and urged into said recess, a trip member mounted on said plate and urged to maintain the plunger in an inoperative position out of said recess and trippable by closing movement of at least one of said jaws, a locking block movable with respect to said plate and plunger from an inoperable position to an operative position in which it prevents movement of said plunger out of said recess, and an actuating member pivoted with respect to said plate and having a portion engageable with said plunger and a portion engageable through lost motion means with said block so as to be moved by said block, after withdrawal of said block from the path of movement of said plunger, to move said plunger rearwardly out of said recess to free said jaws.

4,008,905

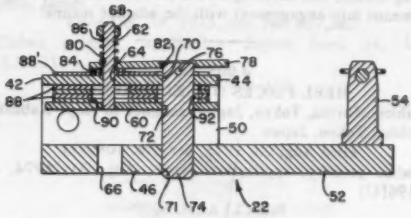
HITCH ADAPTER

Gust Soteropulos, and James Lee Vogt, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 24, 1975, Ser. No. 625,545

Int. Cl.² B60D *1/00*

U.S. Cl. 280—506 **6 Claims**



1. In a hitch adapter for connecting a tractor drawbar having flat, generally horizontal top and bottom sides and a vertical bore, to an implement tongue having a forward hitch element, the adapter including a forwardly open housing adapted to receive the rearward end of the drawbar and including top, bottom and opposite side walls, a vertical pin mounted in the housing and extendable through the drawbar bore, and a pivot member rearwardly of the pin and pivotally connectible to the hitch element on the implement tongue, the improvement comprising: a vertically adjustable, generally horizontal plate member mounted in the housing between the top and bottom walls; shim means insertable between the top of the plate member and the housing top wall to selectively vary the clearance between the plate and the bottom wall, so that the plate member and the bottom of the housing respectively engage the top and bottom sides of the drawbar when the adapter is connected to the drawbar, the selectively variable clearance accommodating drawbars having different vertical thicknesses; and connecting means between the plate member and the housing operative to accommodate vertical adjustment only of the plate member relative to the housing and including spring means operative to bias the plate member upwardly toward the housing top wall to clamp the shim means to the housing.

4,008,906

BALL COUPLING

Richard Arthur Schafer, Traer, and Bennie Joe Vaughn, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

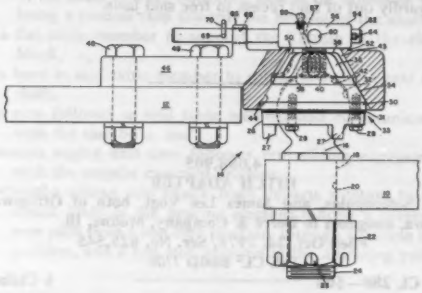
Filed Dec. 19, 1975, Ser. No. 642,557

Int. Cl.² B80D *1/06*

U.S. Cl. 280—511 **8 Claims**

1. A coupling comprising: a hitch ball; frusto-conical cap means having a hemi-spherical opening provided therein for engaging the hitch ball; collar means for encircling a spherical segment of the hitch ball and operatively connected to the cap

means to substantially englobe the hitch ball; adapter means having a frusto-conical opening provided therein for receiving



the cap means; and securing means for releasably drawing the cap means into engagement with the adapter means.

4,008,907

HEEL PIECES OF SKI BINDINGS

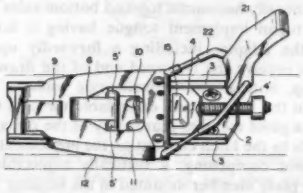
Masahiro Murata, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1975, Ser. No. 608,638

Claims priority, application Japan, Aug. 31, 1974, 49-105196[U]

Int. Cl.² A63C *9/08*

U.S. Cl. 280—614 **6 Claims**



1. A heel piece of a ski binding comprising a base plate adapted to be secured to a ski, a longitudinally extending connecting member having a first end pivotally mounted on a pin carried by said base plate and extending in a transverse direction of an associated ski, a heel piece, means for pivotally connecting a second end of said connecting member at a point longitudinally intermediate said heel piece, a locking member mounted on said heel piece for releasably locking the same to said base plate thereby preventing vertical rotary movement of said heel piece, and means for forming a lost-motion connection between said heel piece and said base remote from said locking member.

4,008,908

SNOW SKI BINDING

William M. Pierson, 1155 Buff Way, Eugene, Oreg. 97401

Filed Jan. 13, 1976, Ser. No. 648,811

Int. Cl.² A63C *9/00*

U.S. Cl. 280—636 **1 Claim**

1. A ski boot binding for a single snow ski and comprising in combination,

a toe piece for attachment to a ski rearwardly of a front mounted binding, said toe piece when attached to the ski having a boot sole supporting surface inclined to the major axis of the ski, said toe piece additionally including sides extending upwardly from opposite sides of the inclined sole boot supporting surface, and

a heel piece for attachment to the ski rearwardly offset from the toe piece and having heel supporting surface elevated from the ski, said heel supporting surface substantially coplanar with said inclined boot sole supporting surface of the toe piece with the plane being inclined to said axis of the ski, said heel piece additionally including upstanding ears on opposite sides of said heel supporting surface to confine the heel against lateral movement.

4,008,909

ACTUATOR FOR SAFETY SEAT BELT SYSTEM

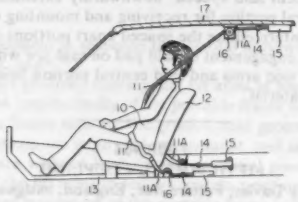
Syuichi Otani, Tokyo, and Hideoki Matsuoka, Kamakura, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 25, 1974, Ser. No. 445,158

Claims priority, application Japan, Feb. 26, 1973, 48-024419

Int. Cl.² B60R *21/10*

U.S. Cl. 280—746 **2 Claims**



1. In a safety belt system for a vehicle, an actuator for retracting and straining a safety seat belt during a collision of the vehicle comprising:

a. a cylinder;

b. a cylinder head mounted on said cylinder at one end thereof;

c. a piston accommodated in said cylinder, having a rod extending outwardly therefrom through said cylinder head for connection with one end of the safety seat belt;

d. a working chamber defined by said cylinder, cylinder head and piston; and

e. a gas generating device for supplying a gas under pressure into said working chamber when energized during a collision of the vehicle, comprising a container, a composition capable of producing a gas by combustion thereof and means to ignite said composition contained in said container, said gas generating device being fixed to said piston such that at least a portion of an open end of said container is exposed to said working chamber; which further comprises means to limit a range of the movement of said rod toward said safety seat belt; and in which said means comprises:

an outer retainer integral with said cylinder head and having a tapered bore coaxial with said cylinder, the small diameter end of said bore being adjacent to said cylinder head;

a cylindrical block integral with said cylinder and having a bore coaxial with said cylinder; and

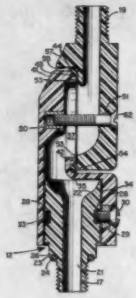
a resilient, cone frustrum shaped inner retainer disposed within the tapered bore of said outer retainer, covered with said cylindrical block, and having a bore coaxial with said cylinder which is nearly equal in diameter to said rod which is arranged to extend therethrough; whereby

said inner retainer abuts with said tapered bore of said outer retainer when said rod begins to move toward the safety seat belt and is compressively deformed to exert a force on said rod to resist further movement of said rod toward the safety seat belt.

4,008,910
UNIVERSAL ELECTRICAL SWIVEL

Thomas F. Roche, 21 W. Main St., Merrimac, Mass. 01860

Filed May 16, 1975, Ser. No. 578,207
Int. Cl.² H02G 13/00
U.S. Cl. 285—164 2 Claims



1. A universal swivel adapted to provide rotation and tilt of electrical apparatus about orthogonal axes and to serve as a conduit for an electrical conductor comprising:

a base member having a generally smooth outer cylindrical bearing surface and an axial passage, adapted for passage of an electrical conductor, said base member being formed at its outer end with means for attachment to said electrical apparatus and at its inner end with generally conical depression communicating with said axial passage;

a central body member formed with an integral cylindrical collar fitted over said cylindrical bearing surface for smooth rotation thereon and formed with a first generally circular dish-shaped portion extending outward from said cylindrical collar, said dish-shaped portion having a cylindrical outer edge surface, the inner end of said collar being substantially flat and sealed but formed with an opening adapted to permit passage of an electrical conductor from said conical depression of said base member through to the inner region of said first dish-shaped portion;

an upper body member formed with a second generally circular dish-shaped portion mating with and adapted to smoothly rotate about said first dish-shaped portion of said central body member, said upper body member being formed with an integral portion having an inner cylindrical wall extending over and smoothly mating with said cylindrical outer edge of said first circular dish-shaped portion of said central body member to limit the angle of rotation of said upper body member about said central body member;

said base member, central body member and said upper body member being formed of insulative, flexurally elastic polycarbonate substantially impervious to acid and alkali substances;

the axis of said outer cylindrical bearing surface of said base member being offset from the axis of said cylindrical collar of said central body member, said collar having a region of increased thickness at one side thereof;

said means for limiting rotation of said central body portion about said base member including an annular recess in said base member;

a stop formed in said recess, and means projecting into said recess from said collar of said central body member, said last-mentioned means being securely affixed in said collar in said region of increased thickness;

the inner surface of said first and second dish-shaped portions cooperating to form a circular hollow chamber; and

means for retaining said circular portions of said central and upper body members in frictional engagement for rotation in a plane parallel to the axis of said base member and for sealing said hollow chamber against the passage of moisture therethrough;

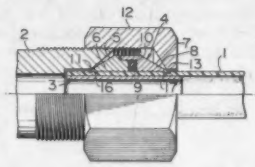
said upper body member having an integral outward extension adapted for attachment to said electrical apparatus and having an axial hollow passage communicating with said circular hollow chamber;

whereby an electrical conductor may pass inward freely through said axial passage and said conical depression in said base member, through said opening in the flat upper end of said central body member and into said circular hollow chamber and outward through said axial passage in said integral hollow extension of said upper body member.

4,008,911
JOINT ASSEMBLY FOR PLASTIC TUBES

Yoshiharu Kiyooka, and Ginji Kaneko, both of Okazaki, Japan, assignors to Maruyasu Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 30, 1975, Ser. No. 627,265
Claims priority, application Japan, Nov. 14, 1974, 49-138031
Int. Cl.² F16L 33/20
U.S. Cl. 285—249 3 Claims



1. A joint assembly for plastic tubes comprising a sleeve inserted into an end portion of a plastic tube for supporting the inner peripheral surface of said end portion, an annular caulking element having a substantially triangular cross section as a whole and composed of two annular members, each having a tapered outer surface, said annular caulking members being adapted to be mounted around said end portion, a body member having an annular seal for receiving a tapered outer peripheral surface of one of said annular members, and a cap nut having an annular seal for receiving the tapered outer surface of another of said annular members and adapted to be screwed onto said body member, said annular members cooperating with each other to define an annular groove of substantially rectangular cross section and an annular elastic sealing element of substantially circular cross section disposed in said groove, said two annular members being engagable with each other for reducing the width of said groove to a size smaller than the normal width of said annular elastic sealing element, the height of said annular groove being substantially the same as the normal height of said annular elastic sealing element.

4,008,912
SELF-TIGHTENING KNOT

Ilijus Kotov, 120 S. Herbert Road, Riverside, Ill. 60546

Filed Dec. 15, 1972, Ser. No. 315,306
Int. Cl.² D04G 5/00; B65H 69/04
U.S. Cl. 289—1.2 4 Claims

1. A self-tightening knot formed from a single strand of a material for tying a tubular casing which comprises

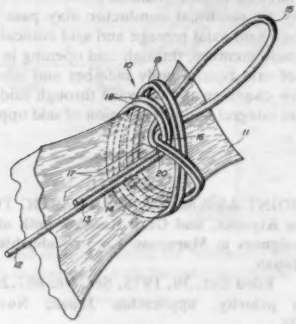
a flexible strand provided with a doubled end portion comprising a standing part and a running part and having a pair of substantially parallel strand segments and an end loop;

at least a pair of turns in the running part of said doubled end portion and about said casing;

a first bight in the standing part of said doubled end portion and adjacent to said turns; and

a second bight in the running part of said doubled end portion between said turns and said end loop;

said second bight formed by passing said running part from the turn toward the end of said casing over all other turns



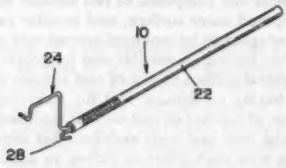
toward the inner portion of said casing and beneath all turns toward the end of said casing providing said end loop to the end of the casing, said first bight formed by passing said standing part from the turn toward the inner portion of said casing under the running part forming said second bight and toward the inner portion of said casing.;

4,008,913

TOOL FOR MAKING WHIP FINISHING KNOT

Lorin Charles Cole, 6052 Montgomery Bend, San Jose, Calif. 95135

Filed Oct. 9, 1975, Ser. No. 621,012
Int. Cl.² D03J *3/00*
U.S. Cl. 289—17 **5 Claims**



1. A fly-tiers tool adapted for forming a whip finishing knot with a thread tied to a fish hook having a shank terminating at an eye portion, said tool comprising:

an elongated handle;

a thread engaging element attached to the end of said handle and having a first portion terminating in a first hook shaped end member spaced axially outwardly from the end of said handle, and a second portion terminating in a second hook shaped end member spaced axially closer to the end of said handle than said first end member, one of said hook shaped end members being substantially aligned with the longitudinal axis of said handle and the other said end member being offset from the longitudinal axis of said handle;

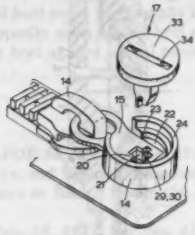
whereby said hook shaped end members are together adapted to retain a loop of the thread so that it can be rotated around the hook shank near its eye portion as an end portion of the thread is held parallel to the hook shank, and so that the loop can be retained until being released as the thread is drawn tight to form the whip finishing knot.

4,008,914

SEALING DEVICES

Michael Denny Anderson, Meopham, England, assignor to Versapak (UK) Ltd, Chislehurst, England

Filed Aug. 29, 1974, Ser. No. 501,630
Claims priority, application United Kingdom, Dec. 12, 1973, 42891/73
Int. Cl.² B65D *55/06*
U.S. Cl. 292—307 R **1 Claim**



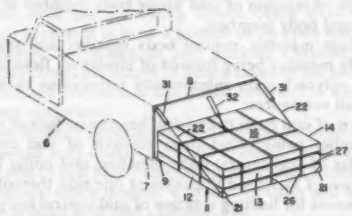
1. A sealing device comprising a disposable part and a part retainable for re-use, said disposable part comprising a head portion and a tail portion, said retainable part including an engageable portion, said tail portion being engageable in said engageable portion to close the seal while said head portion is exposed, said engageable portion and tail portion including cooperating means whereby, once engaged, they are retained together, said cooperating means comprising rotation preventing means for preventing rotation of said tail portion and resilient portions of said tail portion being resiliently deflectable in the same direction on engagement of said disposable part and said retained part, said resilient portion latching under a fixed portion of said retainable part to retain the seal closed, a coin slot means being provided on said head portion and a weakened stem portion interconnecting said head and tail portions so that rotation of said head by a coin engaging said slot causes said weakened stem portion to break to release the sealing device.

4,008,915

IMPACT BARRIER FOR VEHICLES

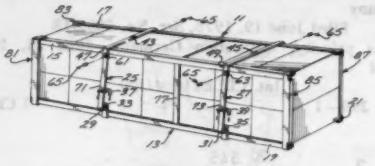
Grant W. Walker, Sacramento, Calif., assignor to Dynamics Research and Manufacturing, Inc., Sacramento, Calif.

Filed June 4, 1975, Ser. No. 583,683
Int. Cl.² B60R *19/04*
U.S. Cl. 293—60 **6 Claims**



1. An impact barrier for vehicles comprising a generally rectangular enclosure open at the bottom and including side walls relatively movable toward each other, means for securing said enclosure to the back of a vehicle in a position projecting rearwardly therefrom, a plurality of substantially solid energy dissipating elements arranged within said enclosure, and means engaging said side walls for forcing said side walls toward each other and into substantial compressive supporting abutment with said elements.

4,008,916
LOAD UNITIZER
Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630
Filed Nov. 6, 1975, Ser. No. 629,328
Int. Cl.[2] B66C *1/16*
U.S. Cl. 294—67 R 9 Claims



1. A load unitizer for holding as a unit a plurality of cargo articles formed with opposed upper and lower corners and of uniform size to be collected together in a row to dispose the respective common corners of said articles in respective straight lines, said unitizer comprising:

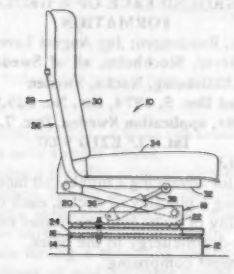
upper and lower frames including respective pairs of spaced apart upper and lower corner retainers for projecting longitudinally of said row of articles, said upper corner retainers being shaped in cross section to nest over said opposite corners of said articles and said lower corner retainers being shaped in cross section to nest over said bottom corners of said articles;

coupling means including connecting arms pivotally connected on their upper extremities in spaced apart relationship to one side of said upper frame and formed on their lower extremities with respective turned-back portions defining first hooks;

second hooks mounted from said one side of said lower frame in spaced apart relationship for connecting with said respective first hooks; and

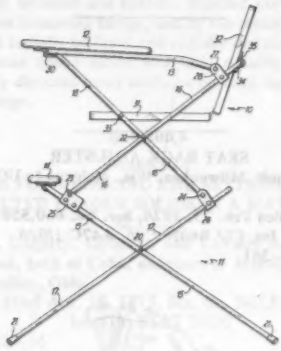
holding means for holding said first and second pairs of hooks connected to one another whereby said cargo articles may be assembled in a row on said lower frame with the respective corners thereof aligned with said upper frame positioned over said articles and said first and second hooks engaged together to hold said frames together and retain said articles on a unit for transfer thereof.

4,008,917
SEAT SAFETY BAR
Herbert Francis Sigwarth, Sherrill, and Richard Lukens Cade, Dubuque, both of Iowa, assignors to Deere & Company, Moline, Ill.
Continuation of Ser. No. 539,794, Jan. 9, 1975, abandoned. This application May 10, 1976, Ser. No. 685,016
Int. Cl.[2] B60N *21/00*; B60R *21/00*
U.S. Cl. 296—65 A 3 Claims



1. In combination with a seat assembly including a base member, a platform, connecting means mounting the platform on the base for fore-and-aft movement between front and rear extreme positions relative to the base member and a seat cushion secured to the platform, a safety device for preventing separation of the platform from the base member in the event of failure of the connecting means, comprising; said base member including a pair of parallel transversely spaced fore-and-aft extending guide slots; an elongate single rigid member having opposite end portions respectively received in the pair of guide slots and secured to said platform.

4,008,918
CHAIRS
Howard Lee Cooper, Ashbourne, and Stewart Banks, Ticknall, both of England, assignors to Products for Proud Parents Limited, Derby, England
Filed July 2, 1975, Ser. No. 592,422
Claims priority, application United Kingdom, Aug. 7, 1974, 34738/74; Oct. 17, 1974, 45440/74
Int. Cl.[3] A47C *4/00*; A47B *39/00*
U.S. Cl. 297—16 5 Claims

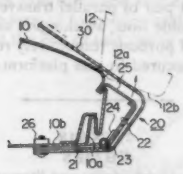


1. A baby chair having a seat and a tray both mounted on a collapsible framework comprising two side frames in the form of X frames, one forming the legs or ground-engaging portion of the chair, and the other, mounted on top of the first, serving to support the seat and tray, the members of the framework being pivotally interconnected to form a lattice type structure which may be collapsed from an extended condition to a substantially flat condition, the seat having a bottom and a back hinged together and both pivotally connected to the framework, and the tray being supported in front of the seat and including a retaining member on its underside for releasable engagement with a cross member at the upper forward end of the upper X frame to maintain the framework in the erected condition.

4,008,919
TILTABLE SEAT LATCH DEVICES
Masakazu Muraishi, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 14, 1975, Ser. No. 577,553
Claims priority, application Japan, May 20, 1974, 49-58035[U]
Int. Cl.[3] B60N *1/10*
U.S. Cl. 297—331 6 Claims

1. A seat comprising a seat member having one lateral side hingedly connected to a stationary structure for pivotal movement between a horizontal position and a certain angular position and having an opposite side, an upstanding backrest having a bottom abutting side resting upon the opposite side of the seat member, and an yieldable latch member rigid with the opposite side of the seat member and hold in a projected latching position by means of the bottom abutting side when the seat member is in said horizontal position, said latch mem-

ber being resiliently deformable by engagement with the bottom abutting side of the backrest to be released from the



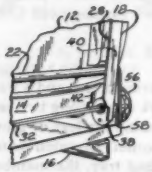
latching position during pivotal movement of the seat member.

4,008,920

SEAT BACK ADJUSTER

O. Harold Arndt, Milwaukee, Wis., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 23, 1976, Ser. No. 660,550
Int. Cl.² B60N *1/06*; A47C *1/026*
U.S. Cl. 297—361 **8 Claims**



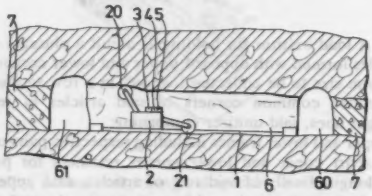
1. An adjustment mechanism for locking a seat back in various positions of adjustment comprising a seat base; first and second spaced apart apertures in each side of the seat base; a pair of spaced apart support members adapted to support a seat back, said support members having a body portion with a pair of opposed side wall portions extending laterally there from; first and second spaced apart apertures in each of said support members said second apertures in each of said support members being elongated; pivot means passing through said first apertures in each side of said seat base and through said first apertures in said pair of support members for pivotally mounting said pair of support members relative to said seat base; a cam support rod pivotally mounted in said second apertures in each side of said seat base; said cam support rod passing through said elongated second apertures in said support members; a pair of spaced apart eccentric cams mounted on said cam support rod, each of said pair of cams lying between and being in peripheral engagement with said pair of opposed side wall portions on each of said pair of support members; an adjustment knob mounted on said cam support rod; spring means for biassing said adjustment knob toward said seat base and locking means on said adjustment knob and seat base for locking said adjustment knob and cam support rod against relative movement relative to said seat base, said adjustment knob being manually movable away from said seat base so as to disengage said locking means and permit said cams to be rotated to pivot said support members about said pivot means.

4,008,921

AUTOMATIC EXCAVATING MACHINE AND METHOD OF OPERATING THE SAME

Norbert Czauderna; Günther Fenske, both of Kirchhellen; Karl-Heinz Klimek; Siegfried Lubina, both of Bottrop; Fritz Malinowski, Kirchhellen, and Bernhard Schönrock, Dinslaken, all of Germany, assignors to Ruhrkohle AG, Essen, Germany

Filed June 19, 1975, Ser. No. 588,518
Claims priority, application Germany, June 21, 1974, 2429774
Int. Cl.² E21C *41/00*
U.S. Cl. 299—1 **7 Claims**



1. A method of controlling the operation of an excavating machine of the type which during a working trip works the face of an excavation, particularly a cutter loader mounted for movement along the length of a face conveyor, or the like, comprising, in combination, the steps of determining the shape of a mineral interface along the length of the face of an excavation by performing mineralogical measurements at a plurality of locations along the length of the face; setting up an interface-shape program in a programmable control arrangement operative for causing the excavating machine to excavate in accordance with the program during at least one working trip; and thereafter causing the excavating machine to perform at least one working trip under the automatic control of the control arrangement, wherein said step of determining the shape of the mineral interface along the length of the face includes determining the inclination of the interface along the length of the face; further including the steps of detecting the discrepancy between the inclination of the interface and the inclination of the cut made by the excavating machine along the length of the face during one working trip and registering corresponding information in an information storage device; and compensating for the discrepancy by causing the control arrangement to modify the operation of the excavating machine during the next working trip in dependence upon the stored information.

4,008,922

METHOD AND A MACHINE FOR ADVANCING AN UNDERGROUND FACE OF A GEOLOGICAL FORMATION

Karl Åke Kallin, Bandhagen; Jan August Larcén, Ektorp, and Waldemar Meyer, Stockholm, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

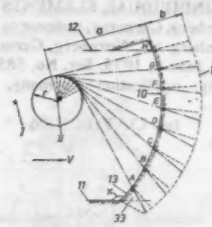
Filed Dec. 5, 1974, Ser. No. 529,968
Claims priority, application Sweden, Dec. 7, 1973, 7316553
Int. Cl.² E21D *9/00*
U.S. Cl. 299—13 **52 Claims**

1. A method for advancing a tunnel end face in rounds, each round comprising a plurality of cycles, each cycle comprising drilling a plurality of holes into the tunnel end face and then applying break-down-energy to the holes,

the improvement comprising:

drilling said holes and applying said break-down-energy with a rig such that said tunnel end face after each round is left with an inclined transition to the tunnel floor and that said tunnel end face, after a complete round, is concave as seen in vertical planes which are substantially

parallel with the direction of advancement, said tunnel end face, after said complete round, forming part of circles in vertical planes which are substantially parallel with the direction of advancement, said circles having their centers on a substantially horizontal straight line that is closer to the roof than to the floor of the tunnel; maintaining the rig at the face during both drilling of said



holes and applying said break-down-energy; and, in a subsequent round, opening up a cut in said inclined transition towards the tunnel floor and then stoping the tunnel end face towards said cut stepwise in at least two of said cycles until the roof is reached, said cut and each said stoping steps extending over substantially the whole width of the tunnel end face.

4,008,923

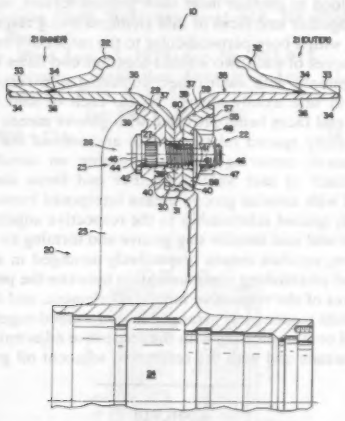
RIM, WHEEL AND FASTENING MEANS ASSEMBLY

William D. Walther, Kettering, and Robert A. DeRegnaucourt, Centerville, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed Sept. 2, 1975, Ser. No. 609,594

Int. Cl.² B60B *23/10*

U.S. Cl. 301—12 R **2 Claims**



2. A combination of a tire carrying rim seated and locked by fastening means on a vehicle wheel,

said wheel having a plurality of spoke members, each of said spoke members having a felloe comprising a radially inclined outer surface merging into a radially directed axially outer surface, each said radially directed axially outer surface having a mounting location for an axially projecting shank of said fastening means,

said rim having radially outwardly directed bead flanges and radially inwardly projecting mounting flanges, each of said mounting flanges having an elongated axially extending portion, integrally attached to a base portion of said rim between said bead flanges, and a radially inclined portion and a radially directed portion, each said radially inclined portion having an inner surface merging into an inner surface on each said radially directed portion, each said radially directed portion having a bore therein for receiving said shank of said fastening means,

each said fastening means comprising said shank, peripheral threads on the axially outer end of said shank, a clamp element supported by said shank, and a rotatable nut mounted on said peripheral threads, each said clamp element having a radially inclined portion and a radially directed portion, each said radially inclined portion having an inner surface merging into an inner surface on each said radially directed portion, each said radially directed portion having a bore therein for receiving said shank of said fastening means,

whereby, said rim is seated on, and thereafter locked on, said spoke members by tightening of each said rotatable nut of each said fastening means and by the mating engagement of said radially inclined and radially directed inner surfaces on each said clamp element with said radially inclined and radially directed portions on each said rim mounting flange, and by the mating engagement of said radially inclined and radially directed surfaces on each said spoke felloe with said radially inclined and radially directed inner surfaces on each said rim mounting flange.

4,008,924

PROCESS FOR REDUCING THE SETTLING RATE OF COMMINUTED POROUS SOLIDS IN A WATER-SOLIDS SLURRY

William B. Gogarty, Littleton, and LaVaun S. Merrill, Jr., Englewood, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 18, 1975, Ser. No. 569,515

Int. Cl.² B65G *53/30*

U.S. Cl. 302—66 **17 Claims**

1. In a process of transporting comminuted solids having a specific gravity greater than about 1.0 and a porosity greater than about 10% in a liquid carrier as a slurry, the improvement comprising substantially saturating the pores of the solids with a liquid hydrocarbon containing up to six carbon atoms and having a specific gravity less than about 1.0 and which is not miscible with the liquid carrier prior to slurrying the solids in the carrier.

4,008,925

VALVE DEVICES FOR USE IN LIQUID PRESSURE BRAKING SYSTEMS OF VEHICLES

Alastair John Young, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England

Filed Nov. 26, 1975, Ser. No. 635,627

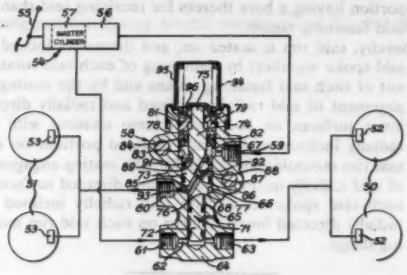
Claims priority, application United Kingdom, Jan. 31, 1975, 4371/75

Int. Cl.² B60T *8/22, 8/26*

U.S. Cl. 303—6 C **10 Claims**

1. A valve device for use in a liquid pressure braking system of a vehicle to so control the pressure that is exerted to apply brakes on a group of wheels of the vehicle that that pressure, under a predetermined condition, is reduced in relation to the pressure at a source from which that pressure is derived, the predetermined condition being the pressure of the braking system at which the valve device becomes operative, including a valve body, a cavity which is formed in the valve body and which has a longitudinal axis, and first and second ports which are formed in the valve body, which communicate with the cavity and which are spaced apart in the direction of the longitudinal axis of the cavity, the first port being for connection to the source of liquid pressure and the second port being for connection to motor cylinders for operating brakes on said

group of wheels; a plunger, a land which is formed by the plunger and which makes a fluid tight sliding joint with a wall portion of the cavity which extends between the first and second ports, the plunger being so arranged that the area thereof exposed to liquid pressure at the first port is less than that exposed to liquid pressure at the second port; stop means which limit movement of the plunger in a direction in which it is biased by biasing means at least during operation of the liquid pressure braking system and which is the direction in which it is urged by the action of liquid pressure at said first port; a passage through the land in the plunger, a oneway valve in the passage, the one-way valve comprising a valve seat, a valve member and resilient means which urge the valve



member to seat upon the valve seat, the one-way valve being orientated so that flow through the plunger from the first port to the second port is prevented when the one-way valve member is seated, abutment means on the plunger and against which the resilient means that act to urge the one-way valve member to seat upon the valve seat react, a valve unseating pin within that part of the passage that extends from the one-way valve seat to the end of the passage that is nearer to the second port, and a stop surface in the cavity which co-operates with the valve unseating pin to unseat the one-way valve closure member when the plunger engages the stop means, wherein the improvement comprises said passage part being inclined to the axis of the plunger.

4,008,926

DEVICE FOR FIXING A BEARING ON A CONCRETE MASS

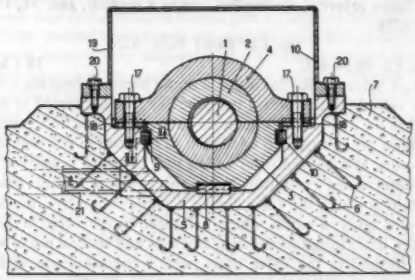
Gérard Belperin, Valdoie, France, assignor to Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T., Paris, France

Filed Dec. 12, 1975, Ser. No. 640,299

Claims priority, application France, Dec. 27, 1974, 74.43063

Int. Cl.² F16C *5/00*

U.S. Cl. 308—3 R **4 Claims**



1. In a mounting arrangement, on a concrete mass, of at least one bearing comprising a journal and a journal case constituted by a support and a collar, the improvement wherein: said journal case rests on a metallic frame which surrounds said support and which is provided with a plurality of projecting arms sunk in the concrete mass.

4,008,927

CRANK SHAFT WELDED TOGETHER FROM INDIVIDUAL ELEMENTS

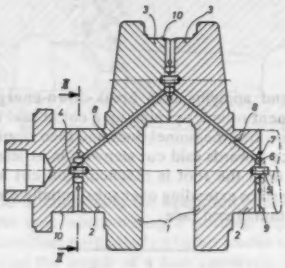
Karl Mayer, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

Filed June 9, 1975, Ser. No. 585,301

Claims priority, application Germany, June 8, 1974, 2427801

Int. Cl.² F16C *3/06*

U.S. Cl. 308—23 **7 Claims**



1. A crankshaft which includes: a plurality of individual elements each comprising a crank pin section with an end face and bearing surface means and also comprising a main shaft journal section with an end face and with bearing surface means, the end face of one crank pin section engaging and being welded to the end face of another crank pin section, and the end face of a main shaft journal section engaging and being welded to another main shaft journal section, each two welded together end faces of said elements being respectively provided with a bore perpendicular to the respective end face, and the bores of each two welded-together end faces being in axial alignment with each other; centering pins respectively inserted in said axially aligned bores, each of said welded-together end faces being provided with groove means extending in radially spaced relationship to and around the respective adjacent centering pin and forming an annular slag groove, each of said welded-together end faces also being provided with annular groove means interposed between and in radially spaced relationship to the respective adjacent centering pin and said annular slag groove and forming an annular oil groove, conduit means respectively arranged in said elements and establishing communication between the pertaining oil grooves of the respective individual element, and lubricating conduits respectively arranged in said welded-together end faces and communicating with the respective adjacent bearing surface means and with the respective adjacent oil groove.

4,008,928

LUBRICATING SELF-ALIGNING BEARING

Martin Abel, 25235 Canterbury, Franklin, Mich. 48025

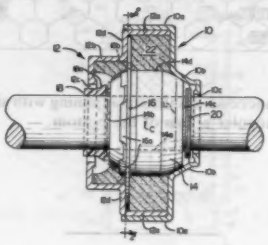
Filed Mar. 25, 1975, Ser. No. 561,993

Int. Cl.² F16C *1/24, 11/08, 25/04, 27/04*

U.S. Cl. 308—72 **5 Claims**

1. A bearing assembly for a shaft, comprising a casing having two coaxial mating casing parts with respective coaxial apertures dimensioned to provide clearance for a shaft journaled in the bearing assembly, one of said casing parts having an interior tapered coaxial socket portion adjacent the respective aperture, a rounded porous bearing with a central bore for a shaft coaxially seated in said socket portion, the other casing part having a coaxial annular shoulder defining an interior

annular recess surrounding and communicating with said bearing, coaxial spring means supported axially against said shoulder in said recess for contacting a rounded surface of said bearing to urge said bearing firmly against said socket portion such that the geometrical center of the bearing is positioned by the axis of the socket portion to form a captive ball and socket arrangement permitting universal pivoting of said bearing to accommodate initial misalignment with a shaft journaled therein, the interior annular recess of said casing being substantially filled with a lubricant impregnated wicking



material, a ring-shaped oil slinger dimensioned to fit tightly around a shaft to be journaled in the bearing assembly for rotation therewith coaxially positioned in an annular end portion of said casing outwardly of said bearing to sling lubricant radially outward into said annular end portion surrounding said oil slinger, said spring means having means for intercommunicating said interior annular recess with said annular end portion to enable lubricant thrown radially outward from said oil slinger to be recirculated to said wicking material in said interior annular recess.

4,008,929

FRICTION DRIVE DEVICE

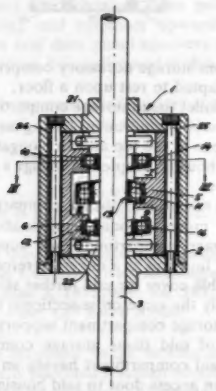
Henrik Gerner Olrik, Bakkegaardsvej 413, DK-3050 Humlebaek, Denmark

Filed Aug. 12, 1975, Ser. No. 603,917

Claims priority, application Denmark, Aug. 12, 1974, 4279/74; July 29, 1975, 3431/75

Int. Cl.² F16C *19/04*

U.S. Cl. 308—176 **19 Claims**



1. A friction drive device for converting a rotary motion into an axial motion comprising drive means and, associated with the rotating member thereof, a friction unit containing ball bearings of larger internal diameter than the external diameter of a shaft and abutting on the inner rings of the bearings at an inclined angle, the friction unit containing further a retaining member in which is provided ball bearing jaws rotating with the retaining member relatively to the shaft and having recesses adapted to support the outer ring of at least one ball bearing and inclined so that the respective bearings abut on the shaft along generating lines and on rotation of the jaws roll on the shaft along helical lines of identical pitch and direction, characterized in that two or more ball bearing jaws (**5, 6, 35, 36, 45, 46**) are retained and angularly spaced apart around the shaft (**3, 31**) and interconnected by means (**21, 22, 23, 23, 30, 50**) adapted to receive the radial pressure of the shaft (**3, 31**) against the bearings (**13, 14, 16, 32, 33**), and that the supporting recesses (**10, 11, 12, 38**) in a section perpendicular to the axis of an associated bearing (**14, 13, 16, 32**) presents a curve whose radii of curvature are greater than the outer radius of the ball bearing (**14, 13, 16, 32**).

4,008,930

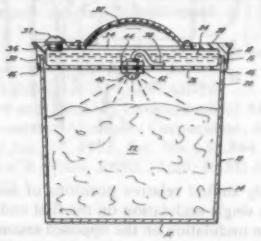
HUMIDOR

Ralph V. Swainson, Houston, Tex., assignor to Texas Bryre Industries, Houston, Tex.

Filed Nov. 14, 1975, Ser. No. 631,886

Int. Cl.² A24F *25/02*

U.S. Cl. 312—31.1 **3 Claims**



1. A humidor comprising,

a body having bottom and side walls forming a storage compartment,

a cover,

means for removably securing the cover to the body to close the storage compartment,

the cover including bottom, side and top walls forming a liquid reservoir,

a domed-shaped depressible portion forming a portion of the top wall operable to apply pressure to liquid in the liquid reservoir,

the cover including a closable filler opening for flow of liquid into the liquid reservoir, and

liquid spray means operable to spray liquid into the storage compartment from the reservoir in response to pressure applied to the liquid by depressing the dome-shaped depressible portion, including a passage extending through the bottom of the cover and a spray nozzle communicating with the passage connected to the bottom and arranged to direct the spray of liquid downwardly into the storage compartment.

4,008,931

END PANEL CONSTRUCTION FOR MODULAR UNITS AND MODULAR UNIT EMBODYING THE END PANEL CONSTRUCTION

Robert J. Kennedy, Jr., and Kendall S. Smith, II, both of West Lafayette, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Sept. 17, 1975, Ser. No. 614,327

Int. Cl.² F16B *12/00*

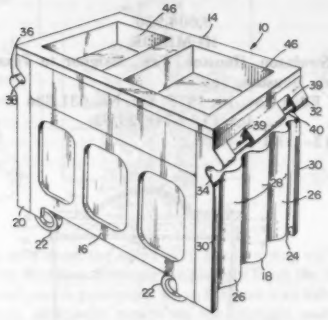
U.S. Cl. 312—111 **17 Claims**

12. End panel construction, especially for a service counter

unit having a frame with sides and ends and a top; first and second end panels for mounting in vertical relation on opposite ends of a frame or on the opposed ends of adjacent frames and comprising respective complementary contoured portions which interfit when the panels are in opposed face to face abutting relation, said first and second end panels also comprising complementary formed elements of latch means thereon which interfit and latch the first and second end panels together in registration in the vertical direction when the panels are in said opposed face to face abutting relation,

said contoured portions on said first and second end panels comprise vertically extending undulations formed therein,

said undulations comprise a plurality of uniformly laterally spaced undulations distributed across the width of the respective end panel and providing for a plurality of



laterally shifted relative positions of said panels with at least a single undulation on the first end panel interfitted with an undulation on the opposed second end panel, said elements of latch means formed on said first and second end panels comprising an inclined tongue and an inclined groove adjacent thereto on each end panel, the tongue and groove on said first end panel inclining downwardly at a predetermined angle and the tongue and groove on said second end panel inclining upwardly at the same angle, said tongues and grooves extending laterally across substantially the entire width of the respective end panels, and the tongue and groove on the first end panel interfitting with the groove and tongue respectively on the second end panel in all adjusted positions of the said panels laterally in which undulations on the opposed first and second end panels interfit.

4,008,932

STRUCTURAL ELEMENT

Jan H. Wildschut, Zeist, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

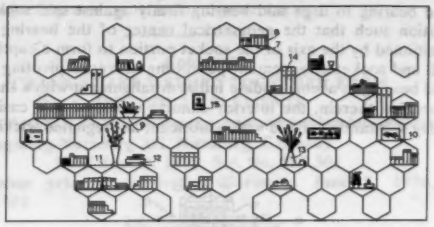
Filed Sept. 24, 1974, Ser. No. 509,024

Claims priority, application Netherlands, Oct. 2, 1973, 7313505

Int. Cl.² A47B *53/00*

U.S. Cl. 312—198 **4 Claims**

1. Structure assembled of structural elements in which each of said structural elements consists of a polygonal, flat bottom and flat walls installed along the circumference of this bottom and positioned at a right angle thereto, which walls, at the angular points of the bottom, have their side edges adjoining, the structural element being characterized in that the bottom has the form of a regular hexagon and the vertical walls have the form of a rectangular trapezium whose difference in length between the long and the short parallel side is equal to half the length of the sides of the hexagonal bottom, which walls are so



arranged that successive walls are adjoining with sides of equal length at the angular points of the bottom.

4,008,933

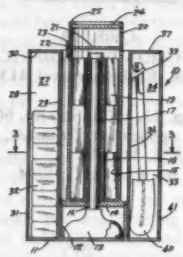
BATHROOM ACCESSORY

Leonard F. Wanek, 301 2nd St. North, Breckenridge, Minn. 56520

Filed July 24, 1975, Ser. No. 598,682

Int. Cl.² A47B *81/02*

U.S. Cl. 312—206 **5 Claims**



1. A bathroom storage accessory comprising:

A. a base adapted to rest upon a floor,

B. a central toilet tissue storage compartment supported on said base, said compartment having an elongated vertical housing open at the top and an elongated central spindle within the housing adapted to engage a plurality of rolls of toilet tissue,

C. a further removable storage compartment of generally the same cross-sectional configuration overlying said tissue storage compartment and supported at the top thereof to function as a cover therefor,

D. a removable cover for said further storage compartment of generally the same cross-sectional configuration

E. a brush storage compartment supported on said base on one side of said tissue storage compartment adjacent thereto, said compartment having an elongated vertical housing, an access door to said housing and hook means within the housing for suspending a brush therefrom, and

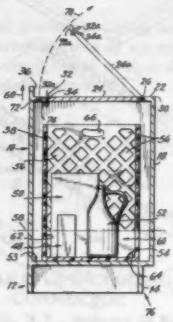
F. a bar soap storage compartment supported on said base on the opposite side of said central tissue storage compartment and adjacent thereto, said compartment having an elongated vertical housing and an access door to said housing.

4,008,934

CHILD PROOF CABINET

George A. Vice, 105C E. Crooked Hill, Pearl River, N.Y. 10965

Filed Feb. 25, 1976, Ser. No. 661,369
Int. Cl.² A47B *81/00, 95/02, 97/00*
U.S. Cl. 312—209 17 Claims



1. A cabinet comprising an enclosure,
said enclosure having a rearmost vertical wall,
a door panel,
a surface of said enclosure being disposed in a horizontal plane,
an opening being disposed in said surface,
hinging means hingably securing said door panel adjacent said opening,
a substantially integrally formed frontmost wall
said hinging means being disposed in spaced adjacent relationship to said frontmost wall,
handle means for manually manipulating said door panel,
said handle means being disposed on said door panel adjacent a marginal edge thereof,
said marginal edge being disposed in spaced adjacent relationship to said rearmost vertical wall,
a hollow container having an open mouth portion disposed at one end thereof,
said door panel being capable of pivotal movement with respect to said hinge means for effectively covering and uncovering said opening,
said hollow container including hand grasping means disposed adjacent said container open mouth portion for manually lifting said container upwardly through said opening when said door panel uncovers said opening,
a supporting surface being disposed within said enclosure, and
said container being supported by said supporting surface when positioned within said enclosure.

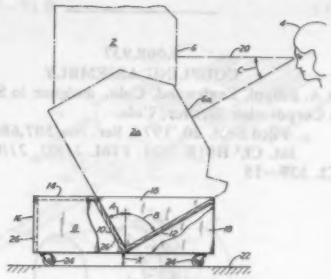
4,008,935

STAND FOR A PROJECTED IMAGE VIEWING APPARATUS

Daniel J. Zeloyle, New Kensington, Pa., assignor to Burrell Industrial Supply Company, New Kensington, Pa.

Filed June 2, 1975, Ser. No. 582,988
Int. Cl.² A47B *81/00*
U.S. Cl. 312—252 3 Claims

1. In use with a projected image viewing apparatus of the type wherein there is provided a screen which displays a projected image thereon for viewing by an observer, a single stand adapted to support said image viewing apparatus which includes a single first flat laterally disposed member inclined rearwardly 20° – 40° from the vertical, a single second flat laterally disposed member inclined forwardly 50° – 70° from the vertical, the lower edges of said laterally disposed members being positioned coextensively adjacent each other, said first laterally disposed member adapted to support the back of said image viewing apparatus, while said second laterally disposed member adapted to support the base of said image viewing apparatus, and recessed support means to maintain said stand as an integral unit whereby said lower edges of said



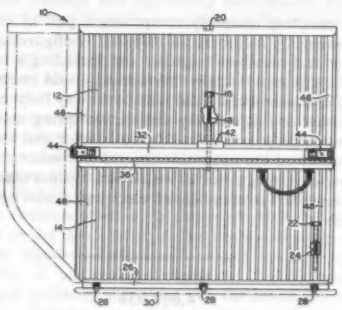
laterally disposed members are positioned at a predetermined height not to exceed 12 inches above said floor, said support means comprising back, front and side members integral with said flat laterally disposed members and provided with additional support means attached to said stand.

4,008,936

LD-3 CARGO CONTAINER

Oscar W. Meller, and John W. Lovich, both of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jan. 23, 1975, Ser. No. 543,564
Int. Cl.² A47B *87/00;* E05D *15/26;* B65D *87/00*
U.S. Cl. 312—352 5 Claims



1. In a cargo container having a top, a base, two end panels interconnecting said top and base, and a header extending along the edge of the top and interconnecting the two end panels, the improvement, comprising:
an upper door section supportingly engaged at the top thereof by the header and having a channel member extending along the bottom edge thereof;
a lower door section having an edge member extending along and obliquely protruding from the top thereof;
a longitudinal hinge interconnected between the channel member and edge member and extending therealong; and
a shelf positioned within said container and vertically adjustable between the top and the base, the shelf having latch pin assemblies protruding therefrom, said latch pin assemblies comprising a pin slidingly received within a bore and having a recessed portion thereabout defining an edge, and a spring strip fixed at one end and flexible at the other for making engagement with the recessed portion to fixedly secure the positioning of the pin within the bore, the spring strip being flexible in a plane perpendicu-

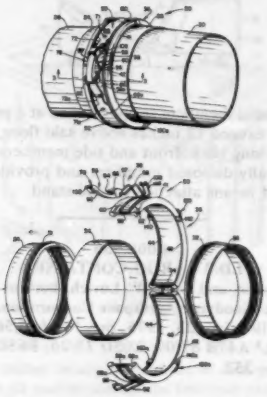
lar to the axis of said pin, wherein the upper door section has an extended edge element along the upper edge thereof and having a U-shaped protrusion extending therefrom for making weight supporting engagement with a lip longitudinally extending along said header.

4,008,937

COUPLING ASSEMBLY

Ernest A. Filippi, Englewood, Colo., assignor to Stanley Aviation Corporation, Denver, Colo.

Filed Sept. 20, 1974, Ser. No. 507,686
Int. Cl.² H01R *3/04*; F16L *21/02, 21/06*
U.S. Cl. 339—15 **23 Claims**



1. A coupling assembly comprising a pair of confronting fluid-conveying members of tubular configuration, means coupling said members together and including a coupler removably circumferentially surrounding said members and limiting displacement of said members away from each other, and at least one electrically conductive spring metal jumper disposed entirely externally of said coupler and mounted on said coupler on the outer side thereof for removal therewith, said jumper having portions which seat against outer surfaces of said members to complete an electrical circuit between said members.

4,008,938

ELECTRICAL CONNECTOR

John W. Anhalt; David S. Goodman, both of Orange, Calif., and Leland W. Oliver, Scottsdale, Ariz., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,752
Int. Cl.² H05K *1/07*
U.S. Cl. 339—17 CF **5 Claims**

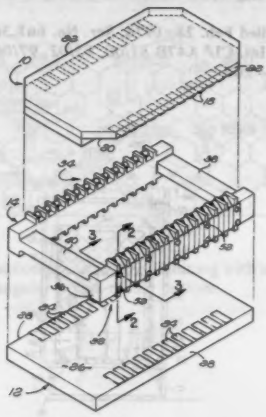
1. An electrical connector member for interconnecting a first electronic component having a first row of spaced conductive traces on the lower surface thereof with a second electronic component having a second row of spaced conductive traces on the upper surface thereof aligned with said first row of conductive traces comprising:

an insulative member having upper and lower surfaces and a vertically extending side therebetween;

a flexible dielectric tape mounted on said side, said tape having an outer surface opposite to said side;

a plurality of vertically extending, parallel, spaced, continuous spring conductive strips bonded to said outer surface; and

each said strip having an upper flexible free end portion and a lower flexible free end portion, said upper end portion being spaced above said upper surface and said lower end



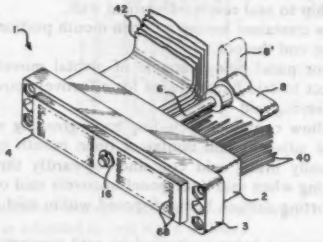
portion being spaced below said lower surface for resiliently interconnecting said traces.

4,008,939

AXIALLY CAMMED HOUSING FOR LOW INSERTION FORCE CONNECTOR

Robert John Kinkaid, New Cumberland, and John Carl Asick, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 361,669, May 18, 1973, abandoned. This application Sept. 17, 1974, Ser. No. 506,801
Int. Cl.² H01R *13/54*
U.S. Cl. 339—75 M **2 Claims**



1. In a low insertion force connector having a plurality of single resilient element electrical contacts in a housing capable of receiving a plurality of male electrical terminals which are initially disconnected from the electrical contacts in the housing, and a cam structure for camming said single resilient elements of said electrical contacts into mechanical and electrical engagement with said received male terminals subsequent to receipt of said male terminals in the housing, the improvement comprising:

said housing being fabricated in two portions,

a first portion of said housing having first receptacle passageways extending therethrough,

a second portion of said housing having second receptacle passageways therein in alignment with said first receptacle passageways of said housing first portion, the second receptacle passageways of said housing second portion terminating in end walls against which said male terminals are seated when received in said receptacle passageways of both said housing first and second portions,

said housing first portion having cam surfaces on said cam structure for engagement against said single resilient elements,

said housing first portion being displaceable in a direction toward said housing second portion and along the lengths of said male terminals to engage said cam surfaces against said single resilient elements and to bias thereby said single resilient elements into engagement with said male terminals, and

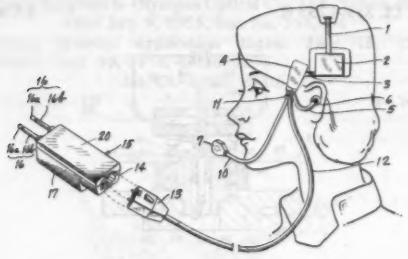
said housing second portion engaging and supporting said received male terminals in said second receptacle passageways during engagement of said single resilient elements with said male terminals.

4,008,940

TELEPHONE APPARATUS INCLUDING ELECTRICAL CONNECTOR

James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,911
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **6 Claims**



1. An electrical connector including:

a. a receptacle having a recess in a surface thereof;

b. a seat in the recess;

c. a first electrically conductive connector element fixed on the seat;

d. two latch plates in the recess at opposite sides thereof;

e. a plug insertable in the recess so that an end of the plug engages the seat;

f. a second electrically conductive connector element on the plug and adapted to mate with the first element when the plug is engaging the seat;

g. two latch members movably supported within the plug at opposite sides thereof, each member having a tooth and an operating segment, said segments projecting outside opposite lateral surfaces of the plug;

h. spring means biasing each latch member to a latching position in which the tooth extends outside one of said lateral surfaces of the plug, each member being movable against its bias to a latch releasing position in which the tooth is retracted within the plug;

i. said latch plates being adapted to be engaged by the teeth on the latch members when said plug engages the seat and said members are in their latching positions, said teeth being releasable from said latch plates by gripping said plug manually at said opposite lateral surfaces to move said segments and thereby said latch members against said spring means; and

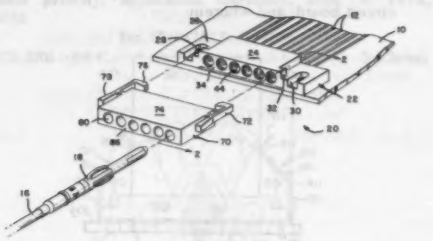
j. means yieldably engaging the end of a plug inserted in the recess and biasing it in a direction to hold the latch teeth firmly against the latch plate.

4,008,941

PRINTED CIRCUIT BOARD HOUSING SYSTEM

Donald Lee Smith, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 4, 1976, Ser. No. 663,649
Int. Cl.³ H01R *17/06, 27/02*
U.S. Cl. 339—91 P **4 Claims**



1. A housing system for connecting a plurality of terminals having a center female receptacle and a cylindrical outer shell to a printed circuit board, which comprises:

a. a first housing of insulating material adapted to be positioned on a printed circuit board, having a plurality of cavities arranged along the front end in a side-by-side relation, a pair of passages extending from each cavity rear wall rearwardly to the back end of the housing, the first passage opening located at the cavity center, and the second passage opening located at the cavity edge, said housing further having latching means thereon;

b. a plurality of signal contact pins of conductive material having a mating section at the forward end and an elongated leg at the other end, said mating section extending into the center of the cavity and the leg extending through the first passage and depending downwardly from the housing for insertion into an opening in the printed circuit board;

c. a plurality of a ground contact pins of conductive material having a sleeve at a forward end and an elongated leg at the other end, said sleeve positioned in the cavity in remote surrounding relation to the signal contact pin mating section and the leg extending through the second passage and depending from the housing for insertion into an opening in the printed circuit board; and

d. a second housing of insulating material having latching means thereon adapted to cooperate with the latching means on the first housing so that the two housings can be latched together, further said second housing having a plurality of passageways extending therethrough and arranged in mating alignment with the cavities in the first housing, each passageway having an inwardly extending collar adapted to retain a terminal therein for connecting with the signal contact pins and the ground contact pins in the first housing when the two housings are latched together.

4,008,942

PRINTED CIRCUIT BOARD HOLDING SPRING

Benedetto Grossi, Norwalk, Conn., assignor to General Signal Corporation, Rochester, N.Y.

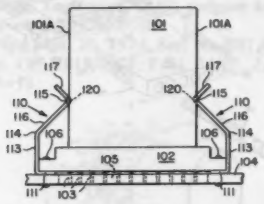
Filed July 29, 1975, Ser. No. 600,171
Int. Cl.² H01R *13/54;* **H05K** *1/14*
U.S. Cl. 339—91 R **4 Claims**

1. In a printed circuit board mounting and support system of the class having a mother board supporting a connector into which one edge of a planar printed circuit board of predetermined thickness is plugged for effecting electrical connections from said printed circuit board to said connector and wherein the improvement comprises:

a. a formed resilient longitudinal retaining spring for supporting the printed circuit board from the edge and for

limiting the motion of said printed circuit board towards parallel planes;

b. said retaining spring having a bend formed thereon at right angles to the length of said retaining spring to form a "V"; and said retaining spring otherwise shaped, formed and supported by the mother board to permit only the vertex of said "V" to contact the edge of the printed circuit board in a line normal to the plane of said printed circuit board; and wherein



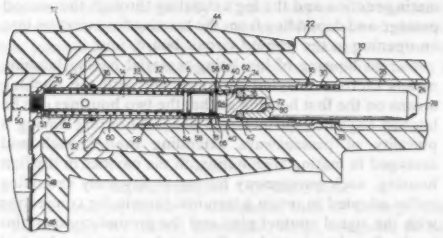
c. at least some of the material of said retaining spring is displaced from the central part of said vertex for a width equal to, or slightly more than, said predetermined thickness for creating a groove whereby when said vertex area is in contact with the printed circuit board said printed circuit board is contacted on its edge and adjacent sides to limit motion of said printed circuit board towards parallel planes.

4,008,943

HIGH VOLTAGE CABLE TERMINATOR HAVING A FAULT ACTUATED PROBE

Richard P. Flatt, Oconomowoc, and Edwin A. Link, Waukesha, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed July 17, 1975, Ser. No. 596,767
Int. Cl.² H01R *13/52*
U.S. Cl. 339—111 **26 Claims**



1. In a high voltage cable terminator for connecting a high voltage cable to a high voltage bushing, a gas actuated contact probe assembly comprising:

a probe contact and means mounted on said probe contact responsive to an increased pressure produced by a prestrike arc of current for accelerating said probe contact into electrical connection to said bushing on close-in.

10. A quick-make contact assembly comprising, in combination:

an electrically conductive probe contact and an electrically conductive bore contact, said contacts being telescopically movable into engagement,

an electrically conductive pressure operated sleeve carried by said probe contact and being responsive to a fault current condition for rapidly connecting said probe contact to said bore contact.

23. A probe contact assembly for accelerating the electrical connection of a high voltage cable terminator to a high voltage bushing under fault current conditions, said assembly comprising:

a probe contact,

a fusible member mounted on the end of said probe contact and including a fusible section,

an insulating cylinder mounted on said fusible member,

and an electrically conductive sleeve mounted on said insulating cylinder and being telescopically receivable on said probe contact,

said sleeve defining a gas chamber around said fusible section,

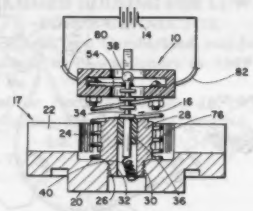
an arc contact ring mounted on said fusible member for initiating an arc on close-in to provide an electrical current path through said fusible member to said probe contact whereby said fusible section will fuse under fault current conditions producing an increase in gas pressure within said chamber to accelerate the movement of said electrically conductive sleeve into electrical engagement with said bore contact.

4,008,944

GLOW PLUG CONNECTOR

Calvin E. Jackson, Rte. 2, Box 197, Chouteau, Okla. 74337

Filed Mar. 8, 1976, Ser. No. 664,537
Int. Cl.² H01R *13/10*
U.S. Cl. 339—253 R **9 Claims**



1. A glow plug connector comprising an insulated plate member having an aperture therethrough for receiving a center pole of a glow plug therethrough, a first conductive elongated lead member having one end secured to one surface of the plate member, the opposite end portion extending across said aperture for selective locking engagement with the glow plug center pole, second conductive elongated lead member having one end secured to the opposite surface of the plate member, the other end portion having yieldable means being conductively engageable with the glow plug when said first lead member is in a lock position for completing an electrical circuit through the glow plug.

4,008,945

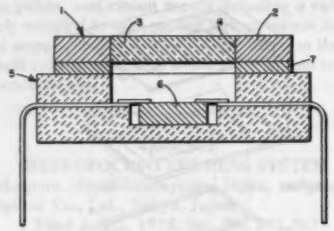
ULTRAVIOLET-TRANSMITTING WINDOW FOR A PROM

Jeremy D. Scherer, Dartmouth, Mass., assignor to Isotronics, Inc., New Bedford, Mass.

Division of Ser. No. 470,123, May 15, 1974, Pat. No. 3,924,246. This application Apr. 17, 1975, Ser. No. 569,001
Int. Cl.² G02B *5/20*
U.S. Cl. 350—1 **11 Claims**

1. An ultraviolet-transmitting window assembly comprising a metallic mounting member with an aperture therethrough, and an ultraviolet-transmitting borosilicate glass member positioned within said aperture, said metallic member having

a higher coefficient of thermal expansion than said glass member and wherein said glass member is held within the aperture



of said metallic member by a fused glass-to-metal hermetic compression seal.

4,008,946

POINTER PROJECTING MEANS FOR MICROSCOPES

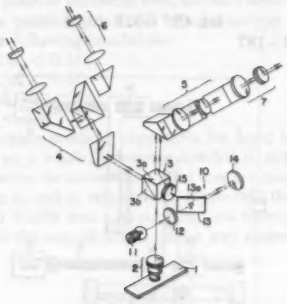
Hiroshi Tsuda, Mitaka, and Toshimi Hayasaka, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 9, 1975, Ser. No. 594,556

Claims priority, application Japan, July 13, 1974, 49-80591; Sept. 10, 1974, 49-103423

Int. Cl.² G02B 27/36

U.S. Cl. 350—10 **6 Claims**



1. A pointer projecting means comprising a microscope objective, a beam splitter arranged on the optical axis of said objective, a first eyepiece for observing a first image of an object formed by said objective after the light from said object passes through said beam splitter, a second eyepiece for observing a second image of the object formed by said objective after the light from the object is reflected by said beam splitter, a first reflecting mirror having a patterned transparent portion and positioned out of the optical axis of said object, means for directing light through said patterned transparent portion to form a pointer image, a second reflecting mirror for reflecting the pointer image back to said first reflecting mirror, a projecting lens, said first reflecting mirror reflecting the pointer image to said projecting lens, said projecting lens transmitting the pointer image to said beam splitter whereby a first image of the pointer is formed by said projecting lens near the first image of the object through reflection by said beam splitter, and a second image of the pointer is formed by said projecting lens near the second image of the object by transmission through said beam splitter, and including means for angularly adjusting at least said second reflecting mirror for effecting pointer image movement.

4,008,947

ELECTRO-OPTICAL SWITCH AND MODULATOR

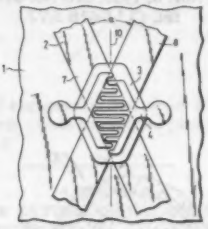
Peter Baües, Krailling; Hans Mahlein; Achim Reichelt, both of Munich, and Gerhard Winzer, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 28, 1975, Ser. No. 599,816

Claims priority, application Germany, Sept. 9, 1974, 2443038

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **3 Claims**



1. In an electro-optical switch and modulator for use in a region of a waveguide system selected from a group consisting of intersecting waveguides and branching waveguides, said waveguides being arranged on a dielectric substrate and consisting of an electro-optical material at the region with at least one dieletric insulating layer engaging the region of the waveguide, the improvements comprising at least one electrode structure being located at the region, each electrode structure comprising a plurality of electrode fingers extending at right angles to a line, said line being a bisector of an angle α of intersection of the intersecting and branching waveguides when the region is located at the point of branching and intersecting and said line being a longitudinal axis of the waveguide when the region is spaced from the point of branching and intersecting, and each of the dielectric insulating layers in the region of the electrode structure consisting of an electro-optical material.

4,008,948

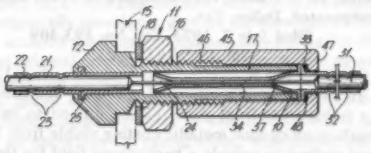
OPTICAL FIBRE CONNECTORS

Jack Frank Daigleish, Ottawa; Helmut Hans Lukas, Carleton Place, and Louis Donald Charron, Greely, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 591,499, June 30, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,369

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **15 Claims**



1. A connector for releasably connecting at least one pair of single optical fibres in abutting end-to-end relationship, said fibres including a plastic coating, comprising two subassemblies and means for releasably retaining the assemblies in assembled relationship;

one of said subassemblies including at least one tubular connecting element having a bore at a rear portion which bore is a close sliding fit on a coated portion of one of said pair of coated fibres and a bore at a forward portion a close sliding fit on uncoated ends of both of said pair of fibres in end-to-end relationship, and a divergent surface at each end of said bore at said forward portion;

the other of said subassemblies including at least one tubular member having a bore at a rear portion a close sliding fit on a coated portion of the other of said pair of coated fibres, and a bore at a forward portion for reception of one of said tubular connecting elements of said one subassembly.

4,008,949

PROTECTIVE REFLECTIVE HELMET

Jerry Martin Luna, 2795 S. Bannock St., Englewood, Colo. 80110

Filed Nov. 6, 1975, Ser. No. 629,212
Int. Cl.² G02B 5/12
U.S. Cl. 350—98 **8 Claims**

1. In a structure having a shell of protective material, the improvement comprising:
   a first layer of light transmitting gel coat containing metal flake and color ingredients uniformly formed over and integral with the outer surface of said shell,
   a plurality of randomly oriented flat reflective chips imbedded in at least portions of said shell and said first layer, each of said chips having a flat outer surface coplanar with the surface of said first layer,
   a second layer of light transmitting gel coat covering said flat outer surfaces of said chips and integral with the non-imbedded portions of said first layer, and
   a third layer of light transmitting gel coat uniformly formed over and integral with said second layer.

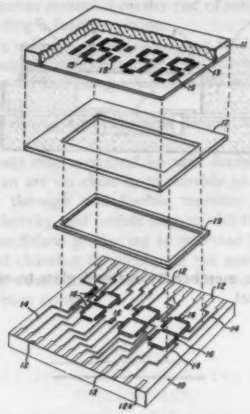
4,008,950

ELECTROCHROMIC DISPLAY CELL STRUCTURE

Richard A. Chapman; Raymond J. Jasinski, and William G. Manns, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 7, 1975, Ser. No. 593,409
Int. Cl.² G02S 5/23
U.S. Cl. 350—160 R **12 Claims**

1. An electrochromic information display cell comprising:
   a. a transparent front panel having affixed to its internal surface an opaque metallic coating visible from its external surface to provide a background field for the display cell, said metallic coating having at least one opening therein permitting viewer observation of internal portions of said cell, and a counter-electrode layer affixed to said metallic coating;
   b. a back panel having affixed to the internal surface thereof at least one display electrode positioned to be viewed through said at least one opening in said metallic coating affixed to said front panel; an electrical contact region corresponding to each of said at least one display electrode and positioned near an edge of said back panel; and an electrically conductive lead coating connecting each electrical contact region with its corresponding display electrode;
   c. a spacer ring member sealed between said front panel and said back panel, and defining an electrolyte chamber which includes said at least one display electrode and at least a portion of said counter-electrode layer; and
   d. an electrolyte within said electrolyte chamber.

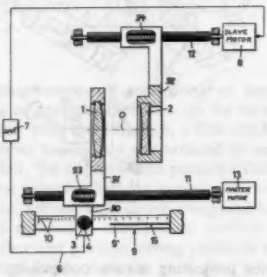


4,008,951

CONTROL MECHANISM FOR OPTICAL SYSTEM WITH INDEPENDENTLY MOVABLE COMPONENTS

Paul Himmelsbach, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

Filed May 27, 1975, Ser. No. 580,568
Claims priority, application Germany, May 28, 1974, 2425645
Int. Cl.² G02B 15/16
U.S. Cl. 350—187 **8 Claims**



1. A control mechanism for simultaneously displacing a plurality of components of an optical system according to a predetermined positional relationship therebetween, comprising:
   first transmission means for the displacement of a first optical component;
   second transmission means mechanically independent of said first transmission means for the displacement of a second optical component;
   master drive means positively coupled with said first transmission means;
   reversible slave drive means positively coupled with said second transmission means and provided with two inputs energizable for movement in opposite directions;
   position-scanning means including a movable member positively coupled with said master drive means for displacement in step with said first optical component, said position-scanning means being provided with first output means emitting a series of stepping pulses of varying density upon a movement of said member at a given speed over a predetermined range, said position-scanning

means being further provided with second output means emitting a control signal in certain parts of said range; and circuit means linking said output means with said slave drive means for operating same under the control of said stepping pulses, said circuit means including a switch operatively coupled to said second output means for applying said stepping pulses to one of said inputs in the presence of said control signal and to the other of said inputs in the absence thereof.

4,008,952

RETROFOCUS-TYPE LENS SYSTEM

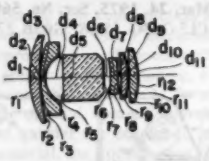
Jihei Nakagawa, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 1, 1975, Ser. No. 592,267

Claims priority, application Japan, July 3, 1974, 49-76054

Int. Cl.² G02B *13/04*

U.S. Cl. 350—215 **6 Claims**



1. A retrofocus-type lens system comprising a first, second, third, fourth, fifth and sixth lens components, said first lens component being a positive meniscus lens, said second lens component being a negative meniscus lens, said third lens component being a positive lens of large thickness, said fourth lens component being a negative lens, said fifth lens component being a positive meniscus lens, and said sixth lens component being a positive lens, said retrofocus-type lens system satisfying the following conditions:

1. $0.14f < d_4 < 0.3f$
2. $0.25f < d_5 < 0.5f$
3. $0.4f < d_5 + d_7 < 0.6f$
4. $f < \Sigma d < 1.4f$

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol d_4 represents the airspace between the second and third lens components, reference symbols d_5 and d_7 respectively represents thicknesses of the third and fourth lens components, and reference symbol Σd represents the overall length of the lens system.

4,008,953

PROJECTOR CONTROL MECHANISM

Serge Besancenot, 20, Avenue de Livry, 93270 Sevran, France

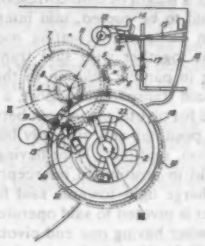
Filed Oct. 22, 1975, Ser. No. 624,828

Claims priority, application France, Oct. 21, 1974, 74.35249

Int. Cl.² G03B *23/02;* **F16H** *35/00, 57/00*

U.S. Cl. 353—103 **5 Claims**

1. A control mechanism for controlling the reciprocating movement of a pusher for a picture-holder in a transparency projector of the type which includes a rotating shaft for driving the pusher to-and-fro, a rotation of 360° of the shaft corresponding to a complete to-and-fro movement of the pusher, and a continuously rotating electric motor, said mechanism comprising two stages of gears for coupling the motor to the shaft, and a control member for initiating the coupling of the motor to the shaft, whereby operation of the control member firstly causes a first of said stages to be engaged, and then a second of said stages to be engaged after engagement of the first stage thereby to complete the coupling of the shaft to the motor, said control member comprising a pivotal arm, a shaft carried by said arm, said first stage comprising a first pinion, said second stage comprising a first toothed wheel, said control member further comprising a second pinion and a second toothed wheel secured together and mounted on said shaft in an arrangement such that upon pivoting of said arm the second toothed wheel engages said first pinion whereafter further pivoting of said arm causes the second pinion to engage said first toothed wheel.



4,008,954

DEVICE FOR EXTINGUISHING UNNECESSARY ELECTROSTATIC CHARGE IN ELECTROPHOTOGRAPHIC COPIER

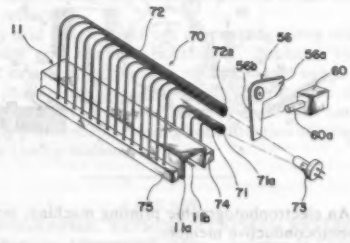
Masaya Ogawa, Sakai; Yuji Enoguchi, Osaka; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Susumu Tanaka, Sakai; Takao Fujiwara, Sakai; Hiroshi Murasaki, Sakai, and Kenichi Wada, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 9, 1975, Ser. No. 584,893

Claims priority, application Japan, July 15, 1974, 49-83865[U]

Int. Cl.² G03B *27/00;* **G03G** *15/00*

U.S. Cl. 355—1 **10 Claims**



1. In an electrophotographic copying machine which comprises a transparent support for support thereon of the original to be copied on a recording medium, said transparent support being reciprocally movably supported for movement between rest and scanned positions, an illumination device for illuminating the original on said transparent support, and an optical image projecting system for transmitting rays of light, which carry an image of the original thus illuminated towards a photoreceptor surface to form an electrostatic latent image thereon, an apparatus for extinguishing unnecessary electrostatic charge formed on the photoreceptor surface by means of an electrostatic charger at an area between each two adjacent areas to be optically exposed to the incoming light, which apparatus comprises:

a source of discharging light;

an elongated light guide for transmitting said discharging light towards said photoreceptor surface therethrough to extinguish said unnecessary electrostatic charge, said light guide having one end situated adjacent said discharging light source in position to receive the discharging light therefrom and the other end situated in the vicinity of said photoreceptor surface; and

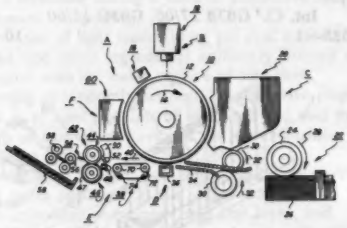
intercepting means positioned between said discharging light source and said one end of said light guide for intercepting the transmission of said discharging light from said discharging light source towards said photoreceptor surface for a length of time corresponding to the length of the original to be copied, said intercepting means comprising an elongated actuating member supported for movement together with said transparent support and extending in parallel relation to the direction of movement of said transparent support, a pivotable plate lever supported for pivotal movement between inoperative and operated positions and normally biased to said inoperative position, said plate lever having one end adapted to be brought in position to intercept said transmission of said discharge light towards said light guide when said plate lever is pivoted to said operated position, and operating member having one end pivotally connected to the other end of said plate lever and the other end held in position in the path of travel of said elongated actuating member, said other end of said operating member being enageable with said actuating member to pivot said plate lever from said inoperative position towards said operated position immediately after the start of movement of said transparent support from said rest position towards said scanned position.

4,008,955

FUSER ASSEMBLY FOR AN ELECTROPHOTOGRAHIC COPYING MACHINE

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 12, 1975, Ser. No. 576,815
Int. Cl.² G03G *15/00;* **F27B** *9/28*
U.S. Cl. 355—3 R **8 Claims**



5. An electrophotographic printing machine, including:

a photoconductive member;

means for charging said photoconductive member to a substantially uniform level;

means for exposing the charged portion of said photoconductive member to a light image of an original document recording thereon an electrostatic latent image corresponding to the original document;

means for developing the electrostatic latent image with toner particles forming a toner powder image of the original document on said photoconductive member;

means for transferring the toner powder image from said photoconductive member to a sheet of support material; and

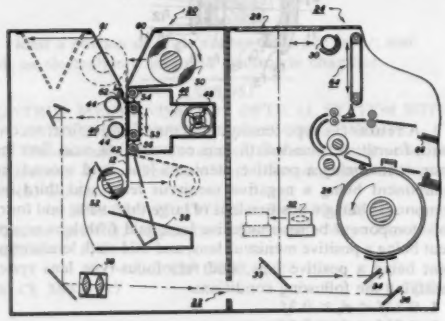
a fusing apparatus for permanently affixing the toner particles to the sheet of support material, said fusing apparatus comprising a heated fuser roll, a backup roll in contact with the fuser roll to define a nip through which the sheet of support material passes with the particles contacting the fuser roll, means for conveying the sheet of support material toward the nip defined by the fuser roll and the backup roll, a plurality of opposed, spaced support members located between said conveying means and the fuser roll, said support members extending in an upwardly direction substantially normal to the path of movement of the sheet of support material in engagement therewith and extending across the sheet of support material in a direction substantially normal to the path of movement thereof, and means for advancing the side marginal regions of the sheet of support material at a greater velocity than the central region thereof as the sheet of support material passes between the fuser roll and the backup roll so as to apply a force component thereon substantially normal to the path of movement of the sheet of support material in a plane defined by the sheet of support material preventing wrinkling thereof.

4,008,956

DOCUMENT HANDLING SYSTEM FOR PRE-COLLATION COPYING

Denis L. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1975, Ser. No. 560,755
Int. Cl.² G03G *15/28;* **G03B** *27/62*
U.S. Cl. 355—8 **4 Claims**



1. In an automatic document handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original documents, the improvement comprising:

an elongated windable document holding web having a document supporting side,

means for forming a spaced pair of oppositely wound scrolls of said web for retaining said documents within said scrolls by the winding up of the documents between the turns of said web on both said scrolls,

said scrolls normally facing one another and forming a nip with said document supporting side of said web,

said web having a minor intermediate unwound segment normally extending sufficiently linearly between said web scroll nips to prevent documents on said intermediate segment from stripping therefrom,

means for automatically multiply recirculatingly winding and unwinding said web with the documents thereon through said intermediate segment between one said web scroll and the other said web scroll to multiply recirculatingly expose individual documents on said intermediate segment of said web in a pre-collated order for making said pre-collated copy sheet sets,

imaging means for imaging documents on said intermediate segment of said web for said copying of said documents, and

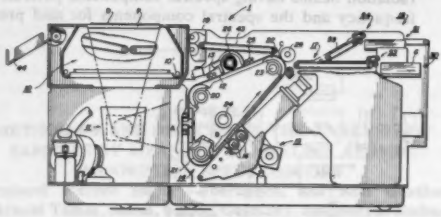
means for loading and unloading documents onto and off of said intermediate segment of said web including means for arcuately deforming said intermediate segment of said web from said normal extension thereof for automatically stripping documents from said intermediate segment of said web.

4,008,957

REPRODUCTION MACHINE CONTROL

James E. Summers, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1975, Ser. No. 581,386
Int. Cl.² G03G 15/22
U.S. Cl. 355—14 2 Claims



1. In an electrostatic type reproduction apparatus having a photosensitive member on which electrostatic images of an original being reproduced are formed, with means to charge the member in preparation for imaging, exposure means to selectively discharge the member to form thereon electrostatic image of the original, means to develop the image, and transfer means to transfer the developed image to a sheet of copy substrate material, the combination of:

a source of said copy substrate material including at least two supply trays, at least one of said supply trays being independently adjustable to accommodate different size copy substrate material;

transport means to advance substrate material from any of said trays to said transfer means for transfer of a developed image thereto;

control means for operating said apparatus to produce a copy run using copy substrate material from a first of said supply trays, said control means including material monitoring means for monitoring the supply of copy substrate material in said first supply tray, said material monitoring means being operative on a preset low supply of copy substrate material in said first tray to switchover to a second one of said supply trays; and

inhibit means operative to intervene and prevent switchover from said first supply tray to said second supply tray during said copy run when the size of the substrate material in said second supply tray is different from the size of the substrate material in said first supply tray.

4,008,958

OPTICAL SYSTEM EFFECTING IMAGE ROTATION

David O. Kingsland, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 24, 1975, Ser. No. 552,003
Int. Cl.² G03B 27/48, 27/50, 27/70; G03G 15/28
U.S. Cl. 355—51 3 Claims

1. An optical scanning system for projecting an image of an object from an object plane to an image plane and having an optical axis including first and second alternate optical paths extending between said object plane and said image plane, said image being in a first orientation at said image plane when projected along said first optical path and in a second orientation, rotated 180° about the axis of propagation from said first orientation, when projected along said optical path, said system including:

a lens to project and image from said object plane to said image plane,

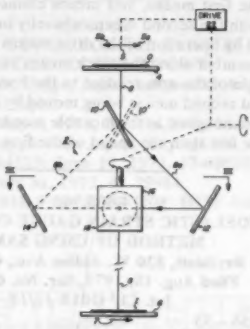
a photoreceptor disposed for uni-directional motion at said image plane,

scan drive means for effecting relative reciprocatory scanning motion of said object and said optical axis,

optical path drive means to place said object plane and said image plane in optical communication successively along said first and said second alternate optical path, and to switch between one to the other of said alternate optical paths at the end of said reciprocatory motion in each direction,

said first alternate optical path including first, second, and third reflectors with said first and third reflectors being in first alternate positions, to rotate an image wavefront propagating from said object in first directions of rotation about each of two orthogonal axes lying in the plane of said wavefront,

said second alternate optical path including first, alternate second, and third reflectors, with said first and third reflectors being in second alternate positions, to rotate an image wavefront propagating from said object in second



directions of rotation opposite to said first directions of rotation about each of said orthogonal axes lying in the plane of said wavefront,

said first and third reflectors being common to both said first and second alternate optical paths, said optical path drive means being operatively connected to said first and third reflectors,

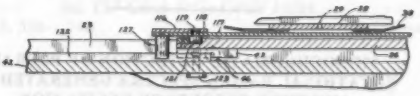
whereby said image wavefront propagating along said first alternate optical path is rotationally displaced by 180° about its axis of propagation relative to said image wavefront propagating along said second alternate optical path so as to project an ordered image of said object onto said moving photoreceptor during both direction of reciprocatory scanning motion.

4,008,959

PHOTOGRAPHIC REPROPORTIONING SYSTEM

James C. Parsons, Minneapolis, Minn., assignor to Combined Services, Incorporated, Minneapolis, Minn.

Filed June 16, 1975, Ser. No. 587,037
Int. Cl.² G03B 27/10
U.S. Cl. 355—84 37 Claims



1. An apparatus for changing one dimension of a two-dimension image projected on a photosensitive film comprising: a support, a first means having a top surface for carrying a sheet having an image thereon or a photosensitive film, means movably supporting the first means on the support, drive means connected to the first means to move the first means along a linear path, a member having an elongated slit allowing light to project onto the top surface of the first means, a light source operable to project light through said slit, opaque cover means attached to the member for covering said top surface, a second means having a top surface located

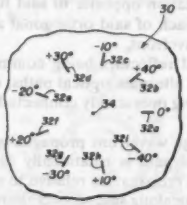
adjacent one side of the first means for carrying a sheet having an image thereon or a photosensitive film, means movably supporting the second means on the support for movement in the same direction as the linear path of the first means, motion transmitting means operably connected to the first means and second means operable to move the second means in response to movement of the first means at a speed equal to or less than the speed of the first means, said motion transmitting means having an arm having a linear edge, pivot means connecting the arm to the first means whereby the arm moves with the first means, holding means for limiting pivotal movement of the arm relative to the first means, a movable member having a portion engageable with the edge of the arm, track means on said support for guiding the movable member along a path extended in a direction at an angle to the linear path of movement of the first means, and means connecting the movable member with the second means whereby on movement of the first means by operation of the drive means the arm moves the movable member along the track means at a speed dependent on the angle of the arm relative to the linear path of the first means, said second means being moved by the movable member at the same speed as the movable member, the speed being equal to or less than the speed of the first means.

4,008,960

PHOTOELASTIC STRAIN GAUGE COATING AND METHOD OF USING SAME

Zinovy V. Reytblatt, 530 W. Aldine Ave., Chicago, Ill. 60657

Filed Aug. 18, 1975, Ser. No. 605,720
Int. Cl.² G01B 11/18
U.S. Cl. 356—33 **18 Claims**



1. A photoelastic strain gauge coating adapted to be bonded to a surface of a workpiece, comprising a sheet of photoelastic material having a multiplicity of minute discontinuity means therein, each of said discontinuity means being operative to display patterns representative of the principal directions of strain and the magnitude of the difference in strain along such directions in the region of the workpiece respectively aligned with each of said discontinuity means, and means for reducing sharp changes of the strain in said sheet of photoelastic material in the region of the boundaries of said photoelastic material and the workpiece.

4,008,961

MONOCHROMATIC DETECTION OF PLURAL ROTATIONAL RAMAN SPECTRA GENERATED BY MULTIPLE FREQUENCY EXCITATION

Joseph J. Barrett, Morris Plains, and Ernest D. Buff, Bernardsville, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

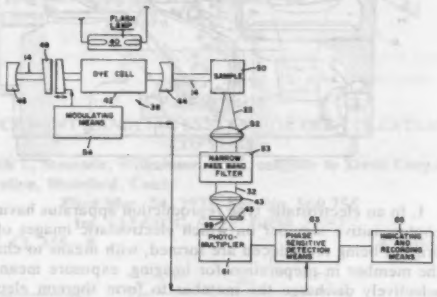
Filed Apr. 21, 1975, Ser. No. 570,107
Int. Cl.² G01J 3/44
U.S. Cl. 356—75 **22 Claims**

1. Apparatus for spectroscopically analyzing gas comprising:

a. radiation source means for generating a plurality of spatially superimposed beams of monochromatic radiation;

b. tuning means for adjusting the frequency difference between radiation beams of adjacent frequencies to equal substantially an odd integral submultiple of the frequency difference between adjacent spectral components of the periodic spectrum for a preselected constituent of gaseous material;

c. projecting means for directing said radiation beams through said gaseous material to produce scattered radiation, the scattered radiation produced by each of said radiation beams having spectral components periodic in frequency and the spectral components for said preselected constituent being superimposed to form, within the spectrum produced by combined scattering of said radiation beams, the periodic spectrum for said preselected constituent;



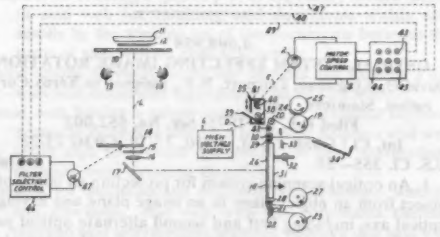
d. filtering means adapted to receive said scattered radiation, for selectively transmitting a detectable signal composed of a single superimposed spectral component of said spectrum, whereby said detectable signal is derived from a plurality of spectral lines and has an intensity substantially equal to their sum.

4,008,962

COLOR PRINTING METHOD

Robert F. Nepper, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 406,189, Oct. 15, 1973, Pat. No. 3,901,592. This application May 23, 1975, Ser. No. 580,367
Int. Cl.² G03B 27/32
U.S. Cl. 355—77 **2 Claims**



1. A method for making a color print from a multicolored original wherein a color present in the original is presented as the same or as a different color in the color print, the method including the steps of

a. providing an apparatus which produces a color print from a multicolored original wherein a color present in the original is presented as the same or different color in the color print, said apparatus providing said color print in accordance with control data provided by manually adjustable controls or in accordance with control data obtained from a stored data media;

b. operating said apparatus using said manually adjustable controls to obtain a desired color print;

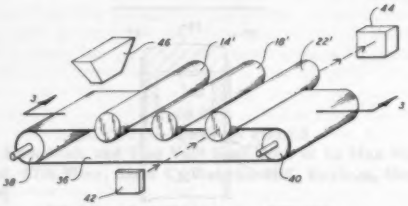
c. determining the control data provided by use of the manually adjustable controls in step (b);
d. storing said control data determined in step (c) in a stored data media which is machine readable for subsequent read out and use in operating said apparatus using the data stored in the stored data media provided by step (c) to provide a reprint of the color print obtained in step (b).

4,008,963

METHOD OF AND DEVICE FOR THE ANALYSIS OF SAMPLES BY MEANS OF FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

Bernhard Werner Huber, Uberlingen, and Rolf Günther Arnold Tamm, Salem, both of Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Germany

Filed Mar. 6, 1975, Ser. No. 555,723
Claims priority, application Germany, Mar. 7, 1974, 2410892
Int. Cl.² G01J 3/42
U.S. Cl. 356—85 14 Claims



1. Apparatus for flameless atomization of a sample for spectroscopic analysis comprising:
means for defining a plurality of chambers disposed in proximity to one another;
continuous conveyor means for transporting in sequence through each of said chambers a sample to be analyzed;
means for heating said chambers to respective predetermined temperatures, each higher than in the preceding chamber in the direction of sample transport, one of said chambers being heated to a temperature required for drying the sample, another of said chambers in the direction of sample transport being heated to a temperature required for ashing the sample, and one of said chambers lattermost in the sequence being heated to the temperature required to effect atomization of the sample; and
means defining a radiation-transparent passage through said lattermost chamber.

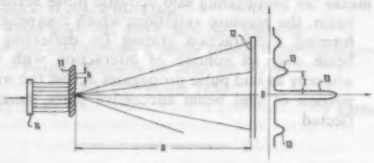
4,008,964

METHOD OF MEASURING THE PITCH OF TWISTED THREADS

Johann Plöckl, Unterhaching, Germany, assignor to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed May 5, 1975, Ser. No. 574,254
Claims priority, application Germany, May 6, 1974, 2421851
Int. Cl.² G01B 9/02
U.S. Cl. 356—109 1 Claim

1. A method of measuring the pitch of a twisted thread having a plurality of turns, comprising: illuminating a plurality of said turns simultaneously from a direction transverse to the length of the thread with monochromatic light, receiving the diffraction image from said illuminated turns on a receiving surface disposed behind the thread, and determining the pitch



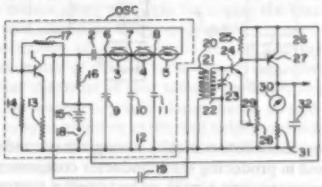
of said thread from the positions of the diffraction maxima of said image.

4,008,965

METHOD AND DEVICE FOR USE IN DETECTING A PRECISE FOCUSING POINT

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Optical Co., Ltd., Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,521
Claims priority, application Japan, May 6, 1972, 47-44222; May 6, 1972, 47-44223; June 17, 1972, 47-60025; July 31, 1972, 47-75960; July 31, 1972, 47-75961
Int. Cl.² G01B 9/00; G03B 7/08; H03F 1/00
U.S. Cl. 356—125 21 Claims



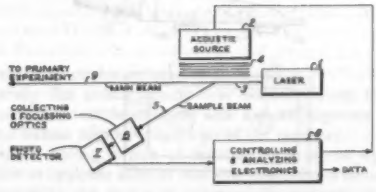
1. A method for detecting the precise focussing point of a lens, comprising the steps of: placing a photoelectric element on the optical path of said lens, said element producing an output indicative of the sharpness of focus;
converting the output of said element to a frequency variation of an A.C. signal; and
detecting from said A.C. signal a signal of a frequency corresponding to said precise focussing point.

4,008,966

METHOD AND APPARATUS FOR BEAM SAMPLING BY ACOUSTIC PULSES

Konrad Frank, Aberdeen, Md., and Peter F. Klon, Cudahy, Wis., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 9, 1975, Ser. No. 620,978
Int. Cl.² G01J 1/42; G01N 21/34
U.S. Cl. 356—218 9 Claims



1. An apparatus for simultaneously sampling and scanning a portion of a light beam with acoustic energy, comprising,

means for generating an acoustic pulse consisting of one or more cycles of a specified frequency and having a length shorter then the width of said light beam,

means for propagating said acoustic pulse across said light beam, the pressure variations which comprise said pulse forming a diffraction grating for deflecting said light beam over its volume of interaction with said pulse, whereby as said pulse propagates across the width of said portion of said beam successive parts thereof are deflected.

4,008,967

DEVICE FOR TESTING MASKS FOR SEMICONDUCTOR COMPONENTS

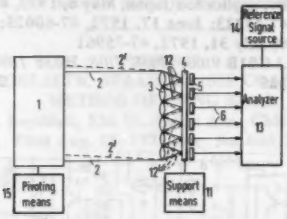
Horst Kiemle, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 19, 1975, Ser. No. 605,913

Claims priority, application Germany, Aug. 29, 1974, 2441336

Int. Cl.² G01N *21/32*; G02B *27/17*

U.S. Cl. 356—239 **8 Claims**



1. A device for automatically testing a mask and particularly masks used in producing semiconductor components comprising means supporting a mask to be tested, a source projecting a beam of coherent light at said mask, multiple optic means disposed in a path of the beam of coherent light for converting the beam into a plurality of individual beams and focusing the individual beams onto the mask, means for detecting light from each of the invdividual beams passing through the mask, and means for pivoting the light beam from the source about at least one axis lying in a plane of the multiple optic means so that all of the individual beams are moved together to scan the mask in at least one direction.

4,008,968

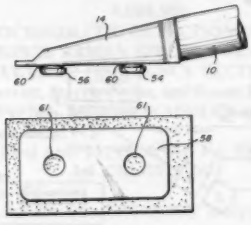
WASHING DEVICE

Leonard E. Hobbs, 710 N. Ocean Blvd., Apt. 410, Pompano Beach, Fla. 33062

Continuation-in-part of Ser. No. 572,743, April 29, 1975, abandoned. This application Oct. 10, 1975, Ser. No. 621,282

Int. Cl.² B43M *11/06*

U.S. Cl. 401—207 **6 Claims**



1. A washing device comprising, a hollow handle having means at one end for receiving a liquid cleaner and a relatively flat wall at the other end defining a flat outer surface having opposite ends, a spout having a passage therethrough and extending from the flat outer surface of the wall, said spout being disposed nearer one end of the flat outer surface, a spout-like member spaced from the spout disposed nearer the other end of the flat outer surface and extending from the flat outer surface, a relatively thin flat plate having a sponge secured thereto, said plate having a pair of apertures spaced the same distance as the spout and spout-like member, one aperture for receiving the spout with the spout extending through the one aperture below the plate and contacting the sponge, the other aperture for receiving the spout-like member with the member extending through the other aperture below the plate and contacting the sponge, both said spout and spout-like member providing securing means in combination with the apertured plate for holding the plate and attached sponge to the handle.

4,008,969

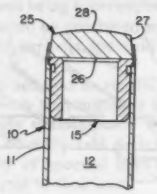
WRITING INSTRUMENT TOP

Olof Verner Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence, R.I.

Continuation-in-part of Ser. No. 480,005, June 17, 1974. This application Oct. 22, 1975, Ser. No. 624,662

Int. Cl.² B43K *9/00*

U.S. Cl. 401—292 **2 Claims**



1. A writing instrument top consisting of a tube having a wall and an axial passageway, a counterbore in said wall providing a shelf in one end of said tube, a ferrule having a primary surface and a smaller secondary surface, a recess separating said primary surface from said smaller secondary surface, a ledge formed at the juncture of said recess with said primary surface and in cooperation with said smaller secondary surface, said ferrule positioned in said axial passageway with said ledge engaging said shelf and said smaller secondary surface engaging said wall to re-enforce said wall, an ornament having a bottom and a side provided with a taper, said ornament positioned in said counterbore with said bottom engaging said ferrule, and said wall deformed against said side provided with a taper to secure said ornament in said counterbore and against said ferrule.

4,008,970

FORCE APPLYING

John Charles Purcupile, Monroeville; Martin J. Dempsey, Bethel Park, and Selwyn Raymond Rackoff, Pittsburgh, all of Pa., assignors to Asko, Inc., West Homestead, Pa.

Filed Nov. 13, 1975, Ser. No. 631,436

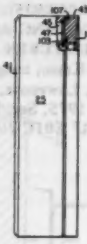
The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.² F16D *3/80*

U.S. Cl. 403—31 **7 Claims**

1. Apparatus for applying pressure to an annular object generally parallel to the axis of said object, including an annular member having a cavity therein, a deformable membrane, of a material capable of withstanding high pressure, whose plane is generally perpendicular to the axis of said annular member closing said cavity and sealed by a weld to said member forming a pressure-tight enclosure for said cavity, means connected to said cavity for supplying a medium for producing

pressure in said cavity to deform said membrane in a direction generally parallel to the axis of said member, and means having a surface engaging said membrane and supporting said



membrane as it is deformed and actuable, on the deformation of said membrane, to transmit force generally in the direction of the axis of said member.

4,008,971

JOINT FOR RATTAN POLES

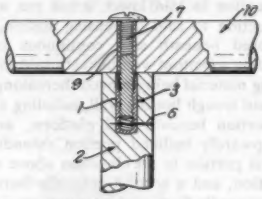
Wong Kam Wah, and Ting Yuet Kam, both of 10 Man Wan Road, 17th Floor, Block C, Waterloo Hill, Kowloon, Hong Kong

Filed Dec. 8, 1975, Ser. No. 638,822

Claims priority, application United Kingdom, Jan. 8, 1975, 779/75

Int. Cl.² F16B *7/00*

U.S. Cl. 403—237 **2 Claims**



1. A mechanical joint comprising:
a. a first cylindrical member having a generally diametrically oriented opening,
b. a second cylindrical member having one end formed to fit the cylindrical contour of the first member and having a generally axially oriented opening aligned with said opening in said first member,
c. an internally threaded insert in said opening of said second member said insert having a closed inner end abutting the inner end of said opening in said second member and extending the full length thereof,
d. means for anchoring said insert in said second member opening,
e. a screw extending through said first member opening and threadably received in said insert,
f. said means for anchoring said insert comprises ribs on the outside surface thereof to prevent rotation of said insert in its second member opening, and including at least one pin oriented normal to the axis of said second member and extending diametrically thru said insert adjacent the inner end thereof.

4,008,972

TUBING CONNECTOR

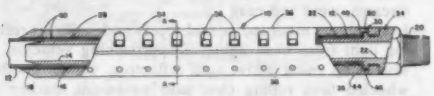
Carl E. Lindberg, New Orleans, La., assignor to Continental Oil Company, Ponca City, Okla.

Filed Sept. 30, 1974, Ser. No. 510,278

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² F16D *1/00*

U.S. Cl. 403—341 **7 Claims**



1. A connector for joining a tool to a substantially rigid metallic tubing, said connector comprising:
a. a substantially rigid tubular member, having an outer diameter smaller than the inside diameter of said metallic tubing, said tubular member being positioned inside said metallic tubing with said outer diameter of said tubular member being in slidable contact with the inside diameter of said metallic tubing;
b. a tool joining means axially attached to one end said tubular member said one end extending beyond an end of said metallic tubing;
c. an elongated substantially tubularly shaped clamp means having means along its length for urging the inner diameter of said clamp means into gripping contact with the outer diameter of said metallic tubing and urging said inner diameter of said metallic tubing into contact with said outer diameter of said tubular member; and
d. means for connecting said clamp means to said one end of said tubular member to prevent axial movement of said clamp means with respect to said metallic tubing and said tubular member
so that when said inner diameter of said clamp means is urged into gripping contact with said outer diameter of said metallic tubing and said inner diameter of said metallic tubing is urged into contact with said outer diameter of said tubular member thus joining said connector to said tubing.

4,008,973

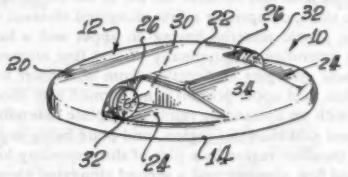
REFLECTIVE PAVEMENT MARKER

Joseph W. Montigny, 2441 Merced, South El Monte, Calif. 91733

Filed Sept. 10, 1975, Ser. No. 611,983

Int. Cl.² E01F *9/04*

U.S. Cl. 404—16 **8 Claims**



1. A reflective pavement marker comprising:
a generally flat and relatively thin marker button to be secured to a vehicle roadway with a given edgewise axis of the button aligned lengthwise of the roadway,
said button having a pair of recesses entering its upper surface at opposite sides of said axis, each recess having a substantially flat end wall substantially midway of the length of the marker and facing in one endwise direction of said axis, and having an inclined side wall extending laterally of and away from said axis,
said inclined recess side walls being oppositely spaced later-

ally of said axis to define a wide load-bearing ramp extending from said recess end walls to the perimeter of said button,

said walls of each recess intersecting to define a single interior corner of the recess and extending outwardly from said corner to the perimeter of said button to define an open recess extending along said button perimeter between the outer ends of said walls, the recess opening in both said one endwise direction of said axis and laterally of said axis, said recess thus defined maintaining itself clean and debris-free under the action of vehicle airstreams, wind and rain,

light reflectors mounted in said recess end walls for reflecting light from head lights of approaching vehicles, and said ramp rising above said reflectors, whereby vehicle wheeled tires rolling over said pavement marker ride along said ramp to the crest substantially midway of the button without contacting said reflectors.

4,008,974

SEALING MEMBER

John Aubrey Miers, Woodford Green, England, assignor to L. J. A. Miers (Exports) Limited, Woodford Green, England

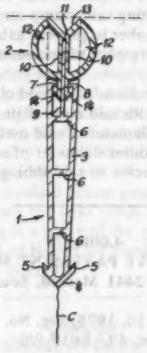
Continuation of Ser. No. 527,867, Nov. 27, 1974, Pat. No. 3,967,911. This application Apr. 21, 1976, Ser. No. 679,132

Claims priority, application United Kingdom, Nov. 28, 1973, 55173/73

The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.

Int. Cl.² E01C *11/02*

U.S. Cl. 404—48 **6 Claims**



1. An insertion member for use in the construction of concrete slabs, comprising a first elongated element of rigid synthetic plastic material having an upper and a lower portion each extending longitudinally of said first element, said first element diverging in direction from said lower to said upper portion, said upper portion being formed with shoulder region and with an upstanding reinforcing plate extending upwardly beyond said shoulder region, said plate being separated from said shoulder region by a pair of slits extending longitudinally of said first element; and a second elongated element of resiliently yieldable material including a bifurcated web extending longitudinally of said second element and having a top end and a pair of limbs extending downwardly from said top end and each having a lower end formed with a laterally extending rib, and a pair of hollow sections laterally flanking said web adjacent said top end thereof, said first and second elements being so connected that said second element straddles said reinforcing plate of said first element and said ribs of said limbs are received in said slits, respectively, so that said plate extends toward the uppermost part of the insertion member and so that, when said hollow sections are evacuated and collapsed against said reinforcing plate for insertion of the insertion member between the slabs, said reinforcing plate reinforces said hollow sections and said shoulder region protects the same from below during said insertion.

4,008,975

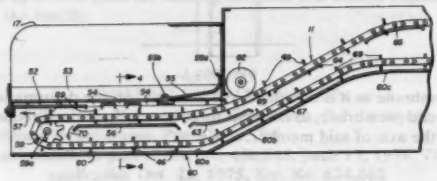
APPARATUS FOR CONVEYING ASPHALT CONCRETE MIXTURES

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving Associates Incorporated, Lawrence, Kans.

Filed Oct. 28, 1975, Ser. No. 626,360

Int. Cl.² E01C *19/12*

U.S. Cl. 404—101 **2 Claims**



1. In a road surfacing machine comprising a self-propelled vehicle, a conveyor apparatus on said vehicle for moving material from a loading station adjacent a front end of said vehicle rearwardly to a dispensing station comprising, a hopper at said loading station for receiving said material from a source of supply such as a truck, said hopper having opening means at the bottom thereof at a first relatively low elevation through which said material passes, a fixed platform mounted beneath said opening means and terminating at locations adjacent forward and rear margins of said opening means for receiving said material, a continuous conveyor having an upper return run passing over said platform and a lower active run passing beneath said platform, said continuous conveyor including a pair of spaced parallel endless flexible elements and a plurality of spaced apart transverse pusher bars extending between said flexible elements at spaced intervals and providing pusher members for sequentially positively advancing substantially all of the material received from the hopper in a first direction to said lower active run and then in an opposite direction to said dispensing station, an open top trough disposed beneath said continuous conveyor, said trough including a bottom wall beneath said lower active run for supporting material being moved therealong by said lower active run, said trough bottom wall including a first generally horizontal portion beneath said platform, an intermediate diagonally upwardly inclined portion extending rearwardly from said first portion to an elevation above said first mentioned elevation, and a second generally horizontal portion extending rearwardly from said intermediate portion substantially to said dispensing station, and a plurality of discrete guide elements spaced above said intermediate and second horizontal bottom portions for engaging and guiding upper runs of said endless flexible elements above material being moved by said lower active run to the dispensing station.

4,008,976

CUTTING TOOL AND METHOD FOR MAKING SAME

Robert A. Holzl, La Canada, Calif., assignor to Chemetal Corporation, Pacoima, Calif.

Continuation-in-part of Ser. No. 470,538, May 16, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 570,551

Int. Cl.² B23B *27/18, 51/02*

U.S. Cl. 408—144 **21 Claims**

1. A cutting tool comprising, a tool body and a thermochemically deposited hard metal alloy layer extending from at least one surface of said tool body, said layer having a thickness of at least about 25 microns and having at least one cutting edge machined within the boundaries of said layer, said thermochemically deposited hard metal alloy being com-

prised primarily of tungsten and carbon and having a Vickers hardnes of at least about 1,500 kg. per sq. mm. and a modulus of rupture in bending of greater than about 200 kg. per sq. mm. in the deposited or deposited and heat-treated condition, and wherein the thickness and strength of said layer are sufficient that the modulus of rupture in bending of the composite of said body and said layer is at least about 200 kg. per sq. mm.

7. A method for making a cutting tool comprising, thermochemically depositing on at least one surface of a body a hard

metal alloy to form a layer having a thickness of at least 25 microns, said hard metal alloy being comprised primarily of tungsten and carbon and having a Vickers hardness of at least about 1,500 kg. per sq. mm., and a modulus of rupture in bending of greater than about 200 kg. per sq. mm. in the deposited or deposited and heat-treated condition, and machining at least one cutting edge in said layer, said layer having a thickness and strength after machining sufficient that the modulus of rupture in bending of the composite of said body and said layer is at least about 200 kg. per sq. mm.

4,008,977

COMPRESSOR BLEED SYSTEM

Wayne Myron Brown, Southwick, Mass., and Joseph Carmen Manente, Jr., Talcottville, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 19, 1975, Ser. No. 614,807
Int. Cl.² F01D *25/12*
U.S. Cl. 415—1 **6 Claims**

1. A method for flowing cooling air from the compressor section of a gas turbine engine to the turbine section wherein said engine has a compressor drum and a drum cavity which are located radially inward of the flow path for the working medium gases and a rotor shaft which connects the compressor drum to the turbine, comprising the steps of:

bleeding air from the flow path for the working medium gases in the compressor section;

discharging the bleed air into the drum cavity in a tangential direction relative to the drum which is opposite to the direction of drum rotation; and

flowing the discharged air radially inward through the drum cavity and axially rearward to the turbine section of the engine.

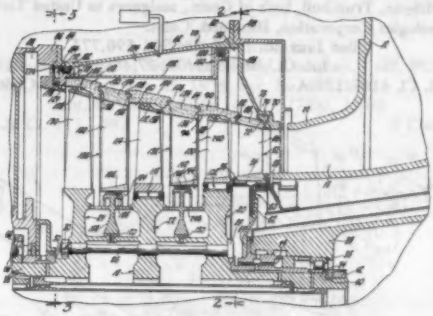
6. The invention according to claim 5 wherein the air is discharged into the compressor drum at an absolute tangential velocity which approaches zero to minimize the vortex pressure loss on the air flowing through the drum cavity.

4,008,978

CERAMIC TURBINE STRUCTURES

Charles H. Smale, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1976, Ser. No. 668,428
Int. Cl.² F01D *25/26*
U.S. Cl. 415—134 **4 Claims**



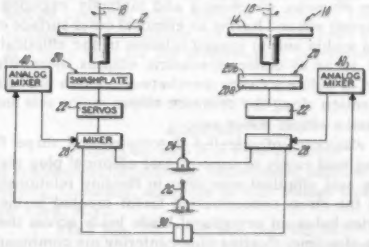
1. A gas turbine comprising a turbine wheel having a turbine blade row therein, a ceramic ring member spaced radially outwardly of said blade row to define a flow passage therethrough, a ceramic stator vane stage interposed axially of said turbine blade row, said stator vane stage including a radially outwardly located ring portion, coacting tongue and groove means on said ring member and said ring portion to join said ring member and ring portion at an axial joint therebetween to define a continuous outer wall having opposite ends thereon, support means including an annular ceramic stop ring in engagement with one of said opposite ends, an axially movable piston in engagement with the other of said opposite ends, and means for applying a primary force on said piston to maintain the joint between said ring member and ring portion as the turbine temperature increases thereby to hold said stator vane stage in a desired position with respect to said support means notwithstanding differences in thermal expansion between said stator vane stage and said support means.

4,008,979

CONTROL FOR HELICOPTER HAVING DUAL RIGID ROTORS

Dean Earl Cooper, Trumbull, and Robert Fuller Klingloff, Huntington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 13, 1975, Ser. No. 631,600
Int. Cl.² B64C *27/80*
U.S. Cl. 416—40 **64 Claims**



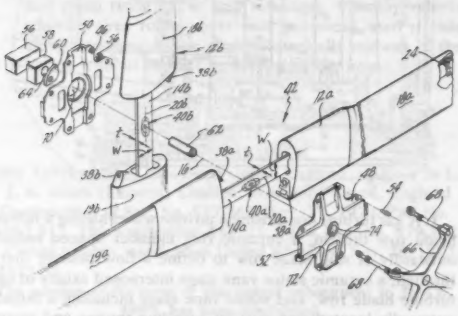
33. A control for a helicopter rotor system utilizing two, rigid, counterrotating rotors including means to selectively vary the phase angle of the rotors as a function of helicopter forward speed to both optimally position the rotor lift vectors so as to produce maximum rotor lift-to-drag ratio perform-

ance, and generate an aerodynamic moment in each rotor to cancel or minimize the gyroscopic precession moment created during maneuver.

4,008,980
COMPOSITE HELICOPTER SPAR AND MEANS TO ALLEVIATE STRESS CONCENTRATION

William Lawrence Noehren, Huntington, and Edward Stanley Hibyan, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 26, 1975, Ser. No. 590,773
Int. Cl.² B64C 11/04, 27/46
U.S. Cl. 416—134 A 18 Claims



1. A two-bladed rotor adapted to be mounted for rotation about an axis of rotation and including:

A. an aerodynamic blade positioned on each side of and substantially equidistant from the axis of rotation,

B. a central spar of rectangular cross section extending through the axis of rotation and connected to each blade to support the blades for rotation about the axis of rotation,

1. being made of high modulus fibers extending substantially parallel to the blade span and joined by a binder, and

2. having an elliptically shaped hole severing said fibers and passing therethrough concentrically about the axis of rotation and with the major axis of the ellipse parallel to the blade span and shaped and sized to produce minimum stress concentration factor across the spar at the hole as the spar carries balanced centrifugal blade loads during rotor rotation,

C. blade pitch change means including a shaft member of circular cross section and extending along and concentric about said axis of rotation and extending through said spar hole,

D. a cylindrical centering pin enveloping said shaft member and located within said spar hole,

E. an elliptically shaped plug member having a circular inner diameter enveloping and matingly engaging said centering pin and having an elliptical outer surface enveloped within and in spaced relation to the elliptical spar hole so as to define concentric ellipses therewith and sized to define a cavity therebetween which has selected dimension along the common ellipse major axis and the common ellipse minor axis,

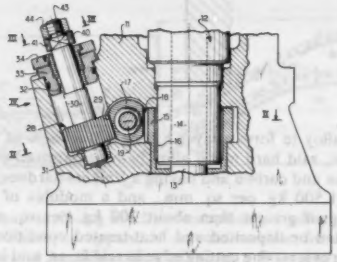
F. an elastomer of selected durometer and shape factor filling said cavity to support said elliptical plug member from said elliptical spar hole in floating relationship so that the stress concentration factor created as the spar carries balanced centrifugal blade loads across the spar hole-elastomer-floating plug-centering pin combination is substantially equal to said stress concentration factor so established in the spar by carrying balanced centrifugal blade loads through said spar hole along, and further, so that the elastomer is capable of withstanding anticipated unequal centrifugal blade loads thereacross, and

G. means independent of said plug member and said elastomer to support and drive said spar and blades in rotation about said axis of rotation.

4,008,981
DEVICE FOR LOCATING THE POSITION OF THE CONTROL RACK OF A PUMP AND FOR LOCKING THE LATTER IN DISASSEMBLING POSITION

Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Mar. 26, 1975, Ser. No. 562,003
Claims priority, application France, May 17, 1974, 74.17318
Int. Cl.² F04B 21/00, 7/04, 39/10
U.S. Cl. 417—63 6 Claims

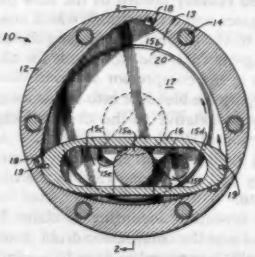


1. Variable displacement pump, for use as a fuel injection pump for an internal combustion engine or the like of the type provided with a constant delivery-stroke piston, the angular position of which inside a casing for the pump determines a particular amount of fluid delivered in each cycle, comprising a toothed rack having a toothed portion, a pinion cooperating with said toothed portion through which said piston is adapted to slide axially, said piston being movable in translation jointly with pump actuating means and to rotate jointly with said pinion for varying said angular position and therefore said particular amount; said pump also including means for displaying said particular amount, comprising an auxiliary shaft pinion adapted to rotate about its own longitudinal center-line disposed in meshing relationship with said rack and supporting an indicating needle supported by said last-named pinion, a graduated sector over which said needle is movable; said pump being also of the type wherein at a given angular position of said piston the latter may be removed from the pump casing and whereby one end of said auxiliary shaft pinion is accessible, said end comprising driving square means for enabling said rack to be displaced manually through the medium of said auxiliary shaft pinion.

4,008,982
ROTARY FLUID ENERGY CONVERTER

Earl W. Traut, 8040 Palm Lake Drive, Orlando, Fla. 32811

Filed Apr. 28, 1975, Ser. No. 572,384
Int. Cl.² F04B 23/10; F01C 1/02, 21/16; F16D 31/00
U.S. Cl. 417—204 8 Claims



1. A rotary fluid energy converter comprising:

at least one chamber,

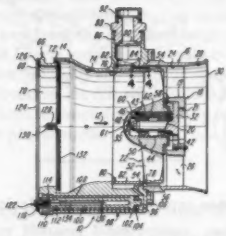
said chamber being generally triangular and including three rounded corners and three interposed arcuate sides,
at least one rotor,
said rotor being elongate and including a longitudinally oriented slot,
said rotor being rotatable end over end within said chamber and dividing it into two compartments,
a rotatable shaft with crank,
said crank extending into said rotor slot and dividing it into two cells,
at least one disk,
said disk being affixed to said crank axially adjacent said rotor,
a fluid inlet port and a fluid outlet port,
each said port comprising an opening in the face of said disk and communicating with an opening in said rotary fluid energy converter,
each said port being shaped and oriented so that it is blocked by said rotor from both said chamber compartments and in communication with one of said slot cells when both ends of said rotor are in corners of said chamber, so that each said port is blocked from both said slot cells and in communication with one of said chamber compartments when one of said rotor ends is located adjacent the midpoint of one of said chamber walls, and so that each said port communicates with one said chamber compartment and one said rotor slot cell at all other positions of said rotor,
so as to occasion energy conversion between torque of said crank acting on said rotor and fluid pressure in said chamber compartments and said slot cells.

4,008,983

TIP TURBINE INFLATING DEVICE WITH MOTOR-ACTUATED CLOSURE AT INLET

Joseph Flatt, Dayton; Robert C. LoPiccolo, Bellbrook, and Eugene Linsker, Kettering, all of Ohio, assignors to Tech Development Inc., Dayton, Ohio

Filed Nov. 27, 1974, Ser. No. 527,745
Int. Cl.² F04B *17/00, 35/00;* **B63C** *7/16*
U.S. Cl. 417—348 **11 Claims**



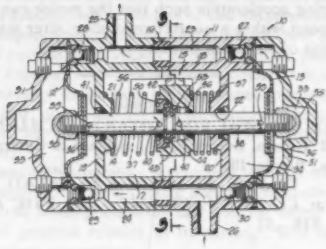
1. Apparatus for producing a flow of air under pressure having particular advantage for use in inflating inflatable articles, particularly those applied to safety purposes, comprising a housing having an inlet thereto and an outlet therefrom, a portion of said housing defining a flow passage interconnecting said inlet and said outlet, a rotor in said flow passage the operation of which will induce a through flow of air under pressure, said rotor including peripherally projected blade segments positioned adjacent and in following relation to a shoulder defined in said flow passage in facing relation to said outlet, the portion of said housing defining said flow passage having formed therein immediately preceding said shoulder a chamber receiving a fluid under pressure from which chamber pressure fluid is directed to drive said blades and thereby to drive said rotor, means in connection with said housing for normally sealing said inlet, the wall structure of said housing embodying means defining axially extended pockets opening from the inlet thereof, in which pockets are contained piston means in connection with said sealing means, said piston means having in connection therewith means for biasing the same in a direction to cause said sealing means to maintain a seal of said inlet and passages defined in said housing communicating said chamber with said piston means to influence the axial displacement of said sealing means substantially simultaneously with the drive of said rotor.

4,008,984

PUMP APPARATUS

William R. Scholle, 3000 Via Mondo, Compton, Calif. 90224

Filed Oct. 23, 1975, Ser. No. 625,252
Int. Cl.² F04B *43/06, 45/00, 17/00, 35/00*
U.S. Cl. 417—393 **6 Claims**



1. A double-acting pump apparatus having a pair of pressurizing diaphragms respectively connected to the ends of a shaft, walls enclosing the shaft-connected side of each diaphragm to form a chamber thereabout, valved pump chambers communicating with the respective diaphragm sides opposite the shaft-connected sides, said shaft including a pair of passageways extending therealong, each of which has a first opening communicating with one of said chambers and a second opening spaced from said first opening and lying outside said chambers, comprising:
an annular valving member slidingly received on said shaft outwardly of said chambers and having an internal chamber for connection with a source of supply of pressurized gas;
first and second compression coil springs received on said shaft at opposite sides of said valving member, said springs engaging both the valving member and one of the walls defining a diaphragm chamber and each spring continuously urging said valving member toward the other spring, whereby said valving member will experience a reciprocating movement along said shaft to interconnect one of said shaft second openings with the pressurized gas while at the same time leaving the other second opening exposed, and then changing interconnection with said shaft second openings; and
a friction ring received on said shaft between the shaft second openings which engages interfering parts of the valving member defining the valving chamber and serves as a limit stop for the reciprocating movement on said shaft.

4,008,985

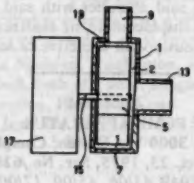
PUMPING DEVICE FOR FLUIDS

Hugo Schemmann, Schaesberg, Netherlands, and Leo Bertram, Stolberg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1975, Ser. No. 543,767
Claims priority, application Germany, Feb. 14, 1974, 2407109
Int. Cl.² F04B *17/00*
U.S. Cl. 417—423 R **4 Claims**

1. A pumping device for fluids, in particular for low viscosity liquids, comprising an annular pump chamber, a pump

impeller having flexible vanes mounted for rotation in said chamber, and a drive motor connected to said pump impeller, wherein the motor is a pure single-phase synchronous motor,



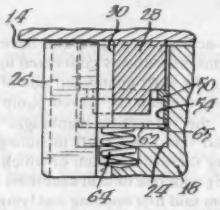
and the impeller vanes have sufficient elasticity to bend backward during acceleration such that the motor can accelerate to full speed within a quarter revolution after starting upon application of electrical power.

4,008,986

CORNER SEAL FOR ROTARY MECHANISMS

Myron R. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1975, Ser. No. 643,431
Int. Cl.² F01C *19/08*; F04C *27/00*; F01C *1/02*
U.S. Cl. 418—51 **9 Claims**



1. In a rotary mechanism having a housing defining a chamber with a rotor movable therein, the combination of:

a piston seal receiving bore in said rotor;

a piston seal received in said bore to be carried by said rotor and sealingly engaging one wall of said chamber, said piston seal being stepped along its length to provide a shoulder within said bore;

an apex seal receiving groove in said rotor and intersecting said bore;

an apex seal received in said groove to be carried by said rotor and sealingly engaging another wall of said chamber; and

a ring-like expander seal within said bore sealingly engaging said shoulder on said piston seal and said bore when gas under pressure is directed to said bore from said groove.

4,008,987

COMBINED TIMING GEAR AND PUMP FOR ROTARY MECHANISMS

James A. Ritchie, Solihull, England, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 7, 1976, Ser. No. 647,296
Int. Cl.² F01C *1/02*, *21/04*; F04C *29/02*
U.S. Cl. 418—53 **6 Claims**

1. In a rotary mechanism, the combination of:

a housing defining an operating chamber;

a shaft journalled in said housing and having an eccentric within said chamber;

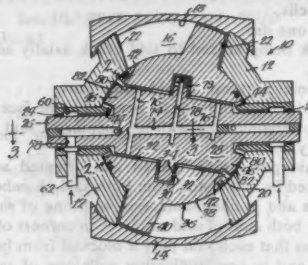
a rotor within said chamber and journalled on said eccentric;

a timing gear carried by said housing and within said chamber and having a predetermined number of teeth;

an internal ring gear carried by said rotor and meshed with said timing gear, said ring gear having a number of teeth greater than said predetermined number whereby a crescent-shaped gap between said gears will exist;

a crescent-shaped pad carried by said eccentric within said gap;

an inlet port in said eccentric adjacent one corner of said pad for supplying hydraulic fluid to said gap; and



an outlet port in said eccentric adjacent the other corner of said pad for conveying pressurized hydraulic fluid to a point of use within said mechanism;

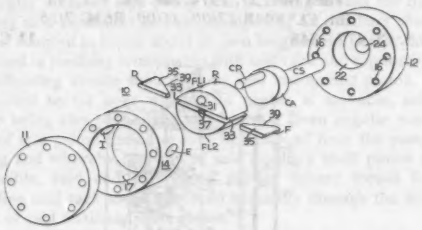
said shaft including a hydrostatic thrust bearing and a conduit in said shaft extending from said outlet port to said thrust bearing.

4,008,988

ROTARY PISTON EXPANSIBLE CHAMBER DEVICE

A. Frank Putz, 401 N. 89th St., Wauwatosa, Wis. 53226

Filed Dec. 16, 1974, Ser. No. 533,332
Int. Cl.² F04C *1/02*
U.S. Cl. 418—54 **44 Claims**



1. A rotary piston expansible chamber device comprising, in combination,

a housing (**10**, FIGS. 1–4) having a cylindrical bore (**17**) whose cross section is a closed curve (U) with the center (O) at the intersection of first and second rectangular coordinate axes (X, Y),

a cylindrical rotary piston (R) rotatable within said bore (**17**) with its axis parallel to the bore axis and having first and second arcuately spaced apices (D, F) which divide said bore into first and second chambers (**C1**, **C2**) on opposite sides of said rotary piston,

a shaft (CS) rotatable within said bore about an axis (C) parallel to the bore axis,

means including a single force transmitting member (CA) carried by said shaft (CS) for operatively connecting said shaft to said rotary piston (R) so that they rotate together in a one-to-one ratio while concurrently permitting rocking movement of said rotary piston (R) relative to said shaft (CS) and to said force transmitting member (CA) about a surface radially outward from the shaft axis and so that said first and second apices are displaced through different angles than said shaft, and

means (17, D, F) for displacing said rotary piston (R) as it revolves together with said shaft (CS) so that said first and second chambers (C1, C2) vary inversely in volume and said first and second apices (D, F) remain in substantially continuous contact with said bore (17) in all positions of said rotary piston R and also so that a straight line (DGF) connecting said first and second apices (D, F) remains perpendicular to a rotatable reference diameter (OGA) through the center (O) of said closed curve (U) in all positions of said rotary piston (R).

4,008,989

BOLT SEAL FOR ROTARY PISTON MACHINE

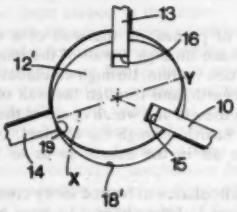
John Michael Clarke, Banbury, and David Stuart Gilchrist, Harwich, both of England, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 10, 1975, Ser. No. 621,428

Claims priority, application United Kingdom, Oct. 10, 1974, 43856/74

Int. Cl.² F04C *27/00*

U.S. Cl. 418—120 **5 Claims**



1. A rotary piston machine comprising a housing, a rotor mounted thereon, and a rotor seal grid comprising a plurality of peripheral and apex seals extending around surfaces of said rotor and together defining closed working chambers in said housing, a plurality of generally cylindrical seal connectors (herein called a bolt) by which adjacent ends of adjacent seals are connected together, each said bolt, located in a respective socket in said rotor and each bolt having clearance laterally of its longitudinal axis from the peripheral wall of the respective socket to permit lateral movement of said bolt in said socket except in one direction laterally of the longitudinal axis of said bolt, in which direction, movement of said bolt is restrained by said bolt being held between fixed laterally opposite positions engaging its peripheral surface.

4,008,990

MOLD PIVOTING MECHANISM

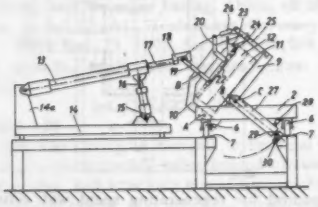
Armin Alexander Hiemer, Unterreitnau, and Siegfried Hermann Jäger, Lindau, both of Germany, assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 26, 1975, Ser. No. 562,165

Claims priority, application Germany, Apr. 1, 1974, 2415703

Int. Cl.² B29B *1/16*

U.S. Cl. 425—454 **8 Claims**



1. A continuously moving molding apparatus having provision for pivoting the molding members thereof to inclined position for venting purposes, comprising:

endless track means, carriage means trained for travel along said track means, and means for advancing said carriage means continuously along said track means;

a mold assembly on said carriage means, said assembly comprising pivotally joined upper and lower mold holding portions and complementary mold head and mold base, respectively, supported therein for movement between open and closed relation, and means mounting said mold assembly for pivotal movement as a whole relative to its carriage;

lever means on said upper mold holding portion for pivoting it relative to said lower portion and for simultaneously latching said portions in closed relation;

a movable support disposed laterally of and movable parallel to a predetermined portion of said endless track means for reciprocation between the limits of said predetermined portion, said support having means for causing it to travel together with said carriage means as it advances continuously along said predetermined portion of said track and, upon reaching the forward limit of said track portion, for causing it to return to the rearward limit thereof;

a mold assembly operating mechanism, fixed to said movable support, for both closing and automatically locking said mold holding assembly and also for tilting it to inclinded position relative to its carriage, said operating mechanism comprising

a pivoting cylinder and piston rod movable between retracted and extended positions in said cylinder, and having means at its free end for engaging said lever of said upper mold holding portion;

means causing said free end of said piston rod to engage said lever means when said mold holding portions are in open position and for pivoting them to and laching them in closed position on extension of said piston rod, and subsequently tilting said mold assembly as a whole relative to its carriage upon retraction of said piston rod, whereby to orient the mold assembly in inclined position for venting;

means for engaging and disengaging the free end of said piston rod from said upper mold holding portion lever; and

means for retaining said mold assembly in inclined position as said carriage advances continuously along said predetermined portion of said endless track after disengagement of said piston rod from said lever, whereby to allow venting of the mold to occur.

4,008,991

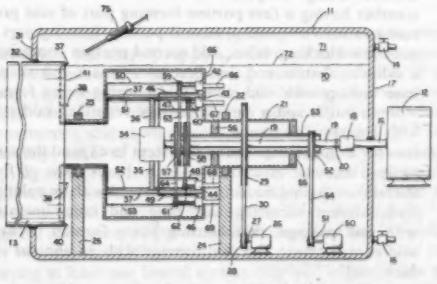
HEAT POWER PLANT

William J. McAleer, R.R. 2, Morocco, Ind. 47963

Filed Oct. 20, 1975, Ser. No. 623,664

Int. Cl.² F23C *5/02*

U.S. Cl. 431—1 **8 Claims**



1. A heat producing apparatus comprising:

a sealed container with a heat outlet;

a source of fuel located externally of said container;

cooling means within said container dividing said container into a cooled portion and an uncooled portion with said uncooled portion providing a combustion chamber;

a frame rotatably mounted in said container and positioned in said cooled portion;

an inertia wheel rotatably mounted and connected to said frame being rotatable therewith, said inertia wheel being at least partially positioned in the said cooled portion;

fuel injectors mounted to said inertia wheel and positioned on said inertia wheel to move to and from said chamber as said inertia wheel rotates, said fuel injectors being connected to said source of fuel and including pump means; and,

ignition means mounted to said container and projecting into said chamber operable to ignite fuel injected into said chamber producing heat.

4,008,992

VALVE SYSTEM, PARTICULARLY FOR CIGARETTE LIGHTER

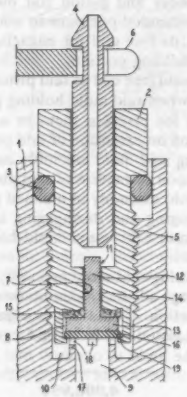
Lars Bertil Johnsson, Jonkoping, Sweden, assignor to Societe anonyme dite Etablissement GENOUD & Cie., Venissieux, France

Filed Nov. 18, 1974, Ser. No. 524,889

Claims priority, application France, Nov. 20, 1973, 73.41913

Int. Cl.² F23Q 2/16

U.S. Cl. 431—344 **10 Claims**



1. A valve system comprising:

a housing connectable with a fluid source;

means forming a pressure-control valve in said housing;

means forming a flow-blocking valve in said housing, both of said means having a valve member in common, said member being composed of elastomeric material, said member having a first portion forming part of said pressure-control valve and a second portion forming part of said flow-blocking valve, said second portion comprising a cylindrical stem and said first portion is a disk-shaped base unitary with said stem, said housing being formed with an outlet and a narrow passage receiving said stem with a narrow clearance;

means for axially compressing said stem to expand the same against the wall of said passage to block flow of fluid therethrough, said housing being formed with an enlarged compartment receiving said base and communicating with said passage, said housing being formed between said compartment and said passage with an annular surface; and

an annular washer of porous and compressable material forming part of said pressure control valve and compressed between said base and said annular surface around said stem.

4,008,993

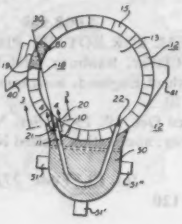
METHOD OF PREHEATING THE WALL OF A FURNACE CHANNEL AND ARTICLE FOR GENERATING CIRCULATION OF HEATED AIR FOR PREHEATING THE WALL OF A FURNACE CHANNEL

Norman W. Severin, Basking Ridge, N.J., assignor to Hotwork, Inc., Lexington, Ky.

Filed Apr. 7, 1975, Ser. No. 565,555

Int. Cl.² F27D 7/00

U.S. Cl. 432—4 **11 Claims**



1. A method of preheating the wall of a channel which extends in a furnace through a wall of the hearth of the furnace at one location therein, through an inductor mounted on the wall of the hearth, and through the wall of the hearth at another location therein and which opens at the opposite ends thereof into the hearth through the channel, comprising:

a. heating the air in the hearth so as to heat the walls thereof;

b. generating circulation of heated air by creating a pressure drop at one end of the channel to draw heated air from the hearth through the channel to heat the wall thereof; and

c. further heating the air in the hearth and channel to further heat the walls thereof.

4,008,994

APPARATUS AND METHOD FOR REGENERATION OF SPENT WET ACTIVE CARBON

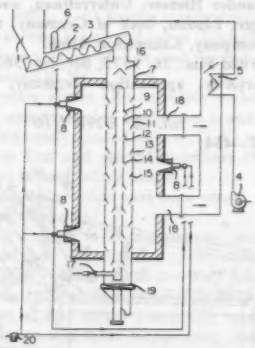
Kouichi Numasaki, Yokohama; Nobutaka Ninomiya, Nagaoka-kyo; Zenji Matsumoto, Izumi, all of Japan; Kiyoshi Adachi, Penang, Malaysia, and Toyohisa Fujimoto, Shimizu, Japan, assignors to Japan Gasoline Co., Ltd., Toyko and Takeda Chemical Industries, Ltd., Osaka, both of, Japan

Filed May 8, 1975, Ser. No. 575,597

Claims priority, application Japan, May 15, 1974, 49-53991

Int. Cl.² F27B 15/10

U.S. Cl. 432—14 **14 Claims**



1. A method for regenerating spent wet active carbon, utilizing a drier, a heating furnace, at least one regeneration chamber disposed inside said furnace, said regeneration

chamber being defined between concentric, radially spaced, inner and outer cylinders which extend vertically in said furnace, said inner and outer cylinders each having a multiplicity of holes through the side walls thereof, comprising the steps of: feeding a stream of wet spent carbon through said drier and therein evaporating water from said spent carbon by heating same with a stream of heated gas wherein the heated gas utilizes the sensible heat of the gaseous products of combustion discharged from said furnace; feeding the stream of dry spent carbon from the drier vertically downwardly into said regeneration chamber so that the spent carbon falls downwardly, by gravity, through the space between said cylinders, simultaneously flowing a regeneration gas through said inner cylinder and outwardly through said holes in the side wall of said inner cylinder into contact with the spent carbon falling downwardly in the regeneration chamber, and simultaneously burning a fuel in said furnace to heat the spent carbon falling downwardly in the regenerating chamber and discharging the gasified substances from the spent carbon through said holes in the wall of said outer cylinder into the furnace so that said substances are burned in said furnace; removing the regenerated active carbon from the lower end of said outer cylinder; discharging the gaseous products of combustion from said furnace and utilizing the sensible heat thereof to evaporate water from the spent carbon in the drier.

6. An apparatus for regenerating spent wet active carbon, comprising: a drier for substantially drying the spent carbon, said drier including means for feeding a stream of spent carbon and means for supplying a stream of heated gas in heat exchange relationship with said spent carbon to evaporate water therefrom; a heating furnace having at least one burner for burning a fuel and also having at least one duct for discharging gaseous products of combustion from said furnace; at least one regeneration chamber disposed within said furnace for being heated by combustion of fuel in said furnace, said regeneration chamber being defined between concentric, radially spaced, inner and outer cylinders that extend vertically in said furnace and at least said outer cylinder penetrates through the top and bottom walls of said furnace, said inner and outer cylinder each having a multiplicity of holes through the side walls thereof; the upper end of said outer cylinder being connected to said drier for receiving dried spent carbon therefrom so that said dried spent carbon falls downwardly, by gravity, through the space between said cylinders, and the lower end of said outer cylinder having means to discharge the regenerated carbon; means connected to said inner cylinder for supplying regeneration gas thereto so that the regeneration gas flows through the openings in the inner cylinder into the space between said cylinders to contact the spent carbon falling downwardly therein to regenerate same and the substances adsorbed in the spent carbon are gasified and flow out through the openings in the outer cylinder into the furnace and are burned therein; and means for utilizing the sensible heat of the gaseous products of combustion flowing through said duct to evaporate water from the spent carbon in said drier.

4,008,995
ROTARY KILN CONSTRUCTION

Hans Mollenkopf, Neubeckum; Ewald Angelbauer, Oelde; Jurgen Wurr; Paul Abel, both of Ennigerloh; Horst Bonisch, Neubeckum, and Antonius Vering, Ahlen, all of Germany, assignors to Polysius AG, Neubeckum, Germany

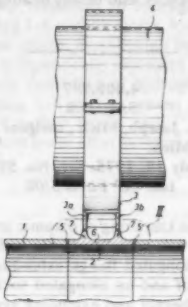
Filed Nov. 21, 1975, Ser. No. 633,969

Claims priority, application Germany, Jan. 14, 1975, 7500800[U]

Int. Cl.² F27B *7/38*

U.S. Cl. 432—80 **8 Claims**

1. A rotary kiln having an elongate, cylindrical casing provided with planetary cooling tubes spaced circumferentially about said casing, and attaching means for attaching each of said tubes to said casing, said attaching means comprising at least one annulus welded into and constituting a longitudinal section of said casing, said annulus having an internal diameter corresponding to that of said casing and having a wall thickness at least as great as that of said casing, a mounting member carried by each of said cooling tubes, each of said mounting members having a predetermined width in a direction axially of said casing, and supporting means extending radially outwardly of said annulus and being secured to the latter and to each of said mounting members, each of said supporting means consisting of a pair of members spaced from one another axially of said casing a distance corresponding to the width of the associated members.



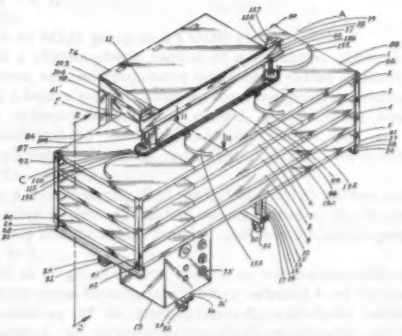
4,008,996
MULTIPLE TIER OVEN

Harold D. Wells, St. Louis County, Mo., assignor to Black Body Corporation, Fenton, Mo.

Filed May 6, 1975, Ser. No. 574,926

Int. Cl.² F27B *13/02*

U.S. Cl. 432—128 **23 Claims**



1. A multiple tier oven comprising of framework, means defining a plurality of superimposed oven chambers mounted on said framework in registering relationship, each of said oven chambers having a floor, means defining an oven-serving deck associated with each oven externally thereof, means maintaining said serving decks in vertically spaced apart relationship, each of said oven chambers being of tunnel form having an ingress at one end and an egress at the opposite end, the related oven-serving deck having first and second end portions adjacent to, and extending respectively from, the ingress and egress of the associated oven chamber in continuity with the tunnel floor thereof, said oven-serving decks each having at least one lateral section disposed adjacent one side of said oven chamber and extending between the associated first and second end portions, an endless conveyor associated with each oven chamber and having an inner course and an

outer course within a plane parallel to the plane of the related oven-serving deck, said inner course presented interiorly of the related oven chamber above the floor thereof, said outer course presented exteriorly of the associated oven chamber above the related deck lateral section, means effecting travel of said endless conveyors, and means heating said oven chambers.

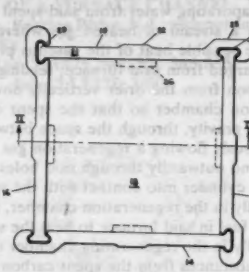
4,008,997

SAGGER

George J. Krasl, St. Joseph, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed July 14, 1975, Ser. No. 595,845
Int. Cl.² F27D 5/00
U.S. Cl. 432—258 10 Claims

1. A sagger for the kiln firing of ceramic articles comprising: a plurality of loosely interfitted side walls, each side wall including an elongated flange extending vertically along one end thereof and an elongated socket formed at the opposite end thereof and extending vertically along said opposite end, said flange and said socket shaped to slidably fit in a corresponding socket and flange, respectively, of adjacent side walls for interlocking said side walls such that they can be separated only by sliding said flange out of said socket; and



floor means extending between said side walls to define an open topped sagger.

4,008,998

TRANSFERS DYEING BY ROLLING UP WEBS WITH A CONDUCTOR

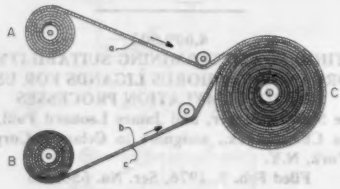
Charles Serex, Geneva, Switzerland; Bernard Hugelin, Gaillard, and Robert Decombe, Ferney-Voltaire, both of France, assignors to Sublistatic Holding S.A., Glaris, Switzerland

Filed May 9, 1974, Ser. No. 468,588

Claims priority, application Switzerland, May 11, 1973, 6691/73

Int. Cl.² D06P 7/00; B41C 1/06

U.S. Cl. 8—2.5 A 17 Claims



1. In a process for dry transfer dyeing or printing which comprises bringing the dry transfer dyestuff and/or optical brightening agent treated surface of a temporary carrier sheet into face-to-face contact with the surface of a substrate to be dyed or printed and heating the joined materials while in contact to a temperature of from 150° to 220° C. for a period of time sufficient to cause transfer of transferable material to the surface of the substrate to be dyed or printed and subsequently separating the temporary carrier from the substrate, the improvement according to which a conductive belt is provided said belt being placed in face-to-face contact with the nontreated surface of the temporary carrier, winding the temporary carrier, substrate to be dyed or printed and conductive belt into a coil, placing the coil in a heated environment and conducting heat into the coil by means of the conductive belt to cause transfer of transferable material to the surface of the substrate to be dyed or printed.

4,008,999

N,N-DIALKYLAMINO DIPHENYLAMINES FOR DYEING KERATINIC FIBERS

Gregoire Kalopissis, Neuilly-sur-Seine; Andrée Bugaut, Boulogne-sur-Seine, and Françoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

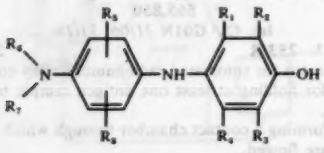
Filed Feb. 21, 1975, Ser. No. 551,653

Claims priority, application Luxembourg, Feb. 22, 1974, 69459

Int. Cl.² A61K 7/13

U.S. Cl. 8—10.2 24 Claims

1. A composition for coloring keratinic fibers comprising in an aqueous or hydroalcoholic solution an effective amount of at least one diphenylamine compound of the formula.



wherein

R_1 and R_4 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1–6 carbon atoms, lower alkoxy containing 1–6 carbon atoms, amino, lower alkyl amino wherein the alkyl moiety has 1–6 carbon atoms, acetylamino, lower carbamylalkyl amino wherein the alkyl moiety has 1–6 carbon atoms, lower hydroxyalkyl amino wherein the alkyl moiety has 1–6 carbon atoms, lower carbalkoxy amino wherein the alkoxy moiety has 1–6 carbon atoms and ureido;

R_2 and R_3 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1–6 carbon atoms, lower alkoxy containing 1–6 carbon atoms, acetylamino and ureido;

R_5 and R_6 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1–6 carbon atoms and lower alkoxy containing 1–6 carbon atoms; and

R_6 and R_7 represent lower alkyl having 1–6 carbon atoms; or a salt thereof.

4,009,000

PROCESS FOR THE DYEING OR PRINTING AND SIMULTANEOUS FINISHING OF CELLULOSE MATERIALS

Hermann Bühler, Reinach, Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,273

Claims priority, application Switzerland, Dec. 21, 1972, 18661/72

Int. Cl.² D06P 3/58, 3/60, 3/68

U.S. Cl. 8—17 16 Claims

1. A process for dyeing or printing and simultaneously finishing cellulose materials, comprising the steps of impregnating the cellulose material with an aqueous liquor containing

a. 10 to 100 g/l of a dyestuff of the formula $(W)_{m-1} - D - [A - X]_n$

wherein

W is an SO_3H group or a COOH group,

D is a chromophoric radical of a formazan, azomethine, nitro, azo, anthraquinone or phthalocyanine dyestuff,

A is a bridge member selected from the group consisting of a heterocyclic-aromatic radical, a substituted amino, carbonamido or sulphonamido radical, or an alkyleneaminocarbonyl radical, or a $-SO_2-$ or a $-NH-CO-$ group,

X is a monohydroxyalkyl radical of 2 to 10 carbon atoms having at least 2 carbon atoms between the hydroxy group and the bridge member, and *m* and *n* are integers of 1 to 5,

b. 20 to 60 g/l of a water-soluble or water-dispersible synthetic-resin-forming intermediate selected from the group consisting of an aminotriazine-formaldehyde addition product, an oxydiaminotriazine-formaldehyde addition product, a dixoyaminotriazine- formaldehyde addition product, a triazone-formaldehyde addition product, a guanamine-formaldehyde addition product, a urea-formaldehyde addition product, a thiourea-formaldehyde addition product, an ethyleneurea-formaldehyde addition product, a dicyanodiamide-formaldehyde addition product, methylolmelamine, methylolurea, methylolethyleneurea at least partially etherified with a C_1–C_5-alkanol, methylolpropyleneurea at least partially etherified with a C_1–C_5-alkanol, methylolguanylurea at least partially etherified with a C_1–C_5-alkanol, methylolacetyleneurea at least partially etherified with a C_1–C_5-alkanol, and 4,5-dihydroxyimidiazolidone-2,

c. 5 to 30% of the weight of the dyestuff of formaldehyde or a water soluble polymeric form of formaldehyde, and

d. 1 to 50 g/l of an acid catalyst;

drying, steaming or cold-storing the impregnated material; and finally heating the material to fix the dyestuff thereon.

4,009,001

PROCESS FOR THE PRODUCTION OF SPACE-DYED EFFECTS ON ACRYLIC YARNS

James P. Reid, Jr., and Bobby L. McConnell, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 468,989, May 10, 1974, abandoned, which is a continuation of Ser. No. 247,385, April 25, 1972, abandoned. This application Sept. 23, 1975, Ser. No. 616,015

Int. Cl.² D06P 5/12, 5/22

U.S. Cl. 8—15 15 Claims

1. A process for producing a space-dyed effect on an acrylic textile material, said process consisting essentially of

contacting at least 5% but less than 80% of the length of an acrylic yarn comprising more than 50% by weight of basic-dyeable acrylic fibers with a resisting amount of an aqueous solution of a polyvalent metal cation selected from the group consisting of calcium, barium, magnesium, strontium, tin, zinc, lead, iron, nickel, cobalt, copper, and manganese ions and mixtures thereof at a pH of about 2.5 to about 8.0,

thereafter bulking the yarn in the relaxed state by steaming at a temperature of about 170° to about 240° F., to fix the metal cation on the yarn and,

thereafter dyeing said yarn with at least one basic dye,

whereby the areas of said yarn treated with said cation resist said dye to produce a space-dyed appearance of said yarn.

4,009,002

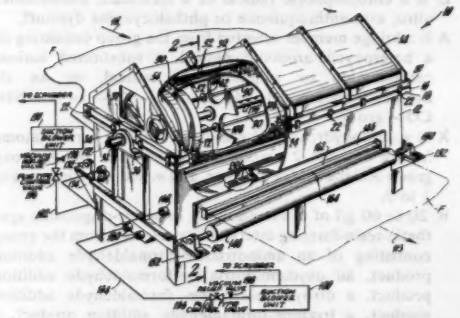
PROCESS FOR TREATING TEXTILE FABRIC TO RETARD INFLAMMABILITY

William Carter, Greenville, S.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Division of Ser. No. 323,655, Jan. 15, 1973, Pat. No. 3,946,497. This application Feb. 11, 1974, Ser. No. 441,471

Int. Cl.² D06B 1/16; D06M 1/04

U.S. Cl. 8—116 P 5 Claims



1. A method for treating a continuous length of textile fabric composed of greater than about 50 percent by weight cellulose previously impregnated with THPOH with gaseous ammonia to impart thereto flame-retardant characteristics, said method being applicable to textile fabrics of various widths wherein said method comprises the steps of flowing a gas selected from the group consisting of ammonia and mixtures of ammonia and air or an inert gas in a confined gas flow path through a hollow cylindrical shell having a cylindrical wall with orifices therethrough, said shell being rotatably mounted within a substantially gas-tight treatment chamber, continuously passing said textile fabric through the interior of said treatment chamber in a manner such that a plurality of the orifices of the cylindrical shell are covered by said fabric and at a line speed within the range from about 15 to 50 yards per minute corresponding to the speed of rotation of the cylindrical shell, and constraining substantially the entire amount of said gas flowing in said path through the orifices covered by said textile fabric and across the path of the said textile fabric to flow directly through said textile fabric, the rate of flow of said gas being within the range from about 0.75 to 5 pounds per minute and being sufficient to substantially reduce the contact pressure between said textile fabric and said hollow cylindrical shell and wherein said treatment chamber has a vacuum applied thereto which serves to draw off the reaction products of the treatment process and ensure a positive flow of gas from the interior of said hollow cylindrical shell.

4,009,003

METHOD FOR DETERMINING SUITABILITY OF TRIORGANOPHOSPHORUS LIGANDS FOR USE IN HYDROFORMYLATION PROCESSES

Adin Lee Stautzenberger, and James Leonard Paul, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,546

Int. Cl.² B01J 31/12; G01N 31/08

U.S. Cl. 23—230 R 8 Claims

1. A method for determining the purity of a triorganophosphorus ligand comprising the steps of:

a. forming an admixture of said ligand and an aldehyde;

b. forming a ligand-free test standard comprised of said aldehyde;

c. heating said admixture and said test standard under like conditions; and

d. comparing the amount of reaction products from said admixture with the amount of reaction products from said test standard.

4,009,004

REAGENT AND METHOD FOR DETERMINATION OF PHOSPHOROUS

Marvin E. Hutchinson, Jr., 5020 Palmetto Way, Pacifica, Calif. 94044

Filed May 17, 1976, Ser. No. 687,354

Int. Cl.² G01N 31/22, 33/16

U.S. Cl. 23—230 B 18 Claims

15. A method of determining phosphate content in serum without removing the protein content therein which comprises admixing a sample of the serum with a reagent comprising ammonium salt of molybdic acid, ferric ammonium sulfate, an acid and a lineating surfactant, and measuring the absorbance on a colorimeter or spectrophotometer.

4,009,005

APPARATUS FOR RADIOIMMUNOASSAY WITH REGENERATION OF IMMUNADSORBENT

Lavell R. Johnson, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Continuation-in-part of Ser. No. 342,513, March 19, 1973, Pat. No. 3,896,217. This application Apr. 7, 1975, Ser. No. 565,850

Int. Cl.² G01N 31/06, 33/16

U.S. Cl. 23—253 R 22 Claims

1. Apparatus for automated radioimmunoassay comprising:

means for holding at least one antigen sample to be analyzed,

means forming a contact chamber through which said samples are flowed,

immobilized immunoadsorbent means positioned within said chamber,

said immunoadsorbent including a particulate material having chemically bound thereto an antibody specific to the antigen in said sample and for forming a fraction bound to said antibody and an unbound fraction which passes through said chamber,

means forming a storage for eluant solution,

flow line means for flow of fluid to and from said contact chamber,

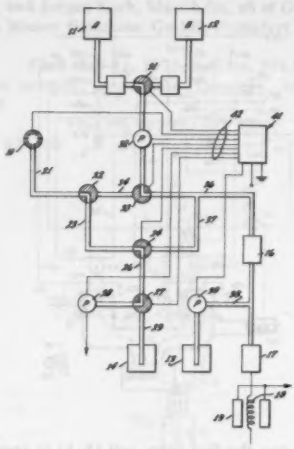
means for detecting radioactive impulses positioned to receive impulses of a radioactive material from at least one of said bound and unbound fractions in said flow line means,

means for directing flow of an antigen sample and a radioactive labelled antigen into said contact chamber to form said bound and unbound fraction,

means to direct flow through said contact chamber of solvent to effect stoichiometric release of the antigens bound to said immobilized immunoadsorbent to form a released bound fraction

means to effect flow sequentially of successive antigen samples throuch said contact chamber for assay thereof and to effect flow of eluant solution through said chamber subsequent to flow of each said antigen sample; and

said detecting means being operative to receive impulses from one or both of said unbound fractions and said released bound fraction passing through said flow line means.

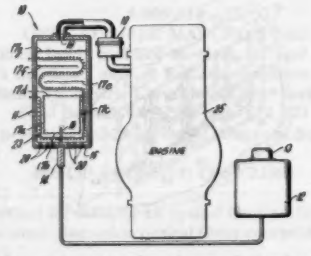


4,009,006

WATER TO FUEL CONVERTER

Frank Hreha, Sun Valley Drive, Croton Falls, N.Y. 10518

Filed Aug. 18, 1975, Ser. No. 605,439
Int. Cl.² B01J *1/00, 8/00;* **C01B** *1/18*
U.S. Cl. 23—281 **4 Claims**



1. A water to fuel converter comprising:

a pressurized water source,

a heater connected to the water source for heating said water,

an insulated chamber having a plurality of copper screens mounted therein,

means for heating said chamber, comprising a heating coil mounted about said copper screens, said chamber having an outlet aperture at the upper end thereof and a plurality of air inlets in the base thereof, and,

a spray nozzle on the outlet of the heater mounted through the base of the chamber to spray the pressurized water into said heated chamber and through the copper screens wherein it becomes decomposed into gases which escape through the outlet aperture to serve as a fuel.

4,009,007

TANTALUM POWDER AND METHOD OF MAKING THE SAME

Stanley S. Fry, North Chicago, Ill., assignor to Fansteel Inc., N. Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,569
Int. Cl.² C22C *1/04;* **H01G** *9/05*
U.S. Cl. 29—182.5 **20 Claims**

1. A tantalum powder containing an added phosphorus-containing material in an amount equivalent to from about 5 to about 400 parts per million of elemental phosphorus.

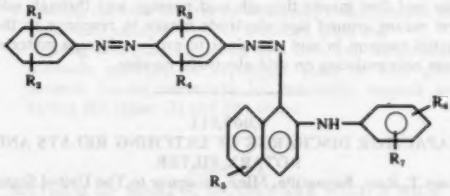
4,009,008

COLORED WATER IMMISCIBLE ORGANIC LIQUID

Richard B. Orelup, Upper Saddle River, N.J., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Division of Ser. No. 313,591, Dec. 8, 1972, Pat. No. 3,862,120. This application Nov. 18, 1974, Ser. No. 524,528
Int. Cl.² C10L *1/10, 1/22;* **D06P** *1/08*
U.S. Cl. 44—59 **3 Claims**

1. A colored water immiscible organic liquid having dissolved therein a disazo colorant corresponding to the formula



in which R_1 is H, CF_3, or alkyl having from 1 to 4 carbon atoms, R_2 is H or alkyl having from 1 to 4 carbon atoms, R_3 and R_4 are each H, OCH_3, OC_2H_5 or CH_3 and R_5, R_6 and R_7 are each H or alkyl having 1 to 12 carbon atoms, at least one of said R_5, R_6 and R_7 being alkyl, said disazo colorant being highly resistant to removal from said organic liquid by the commonly used adsorbents such as carbon black, charcoal, clay and silica.

4,009,009

PROCESS FOR REDUCING THE COS CONTENT OF GASEOUS HYDROCARBON STREAMS BY USE OF SUPPORTED LEAD OXIDE

Franklin E. Massoth, Salt Lake City, Utah, and John E. Young, Jr., Woodridge, Ill., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 492,276, July 26, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,427
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—73 **14 Claims**

1. A process for reducing the COS content of a gaseous feedstream free of arsenic which comprises:

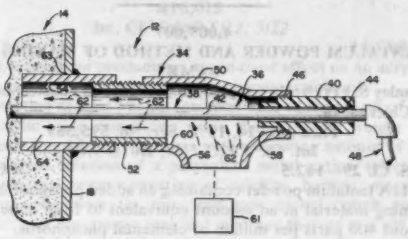
contacting said feedstream at a temperature of 80° F. to 250° F. with a sorbent dispersed upon a carrier material, said sorbent consisting essentially of lead oxide, and

recovering a product gas stream containing less than 10 ppb of COS.

4,009,010
METHOD AND APPARATUS FOR FOAM SCRUBBER LEVEL DETECTOR

Philip D. Sauer, and Thomas F. Payne, both of Flathead, Mont., assignors to The Anaconda Company, New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,679
Int. Cl.² B01D 47/04
U.S. Cl. 55—87 9 Claims



1. In a foam scrubbing apparatus comprising a container having inlet and outlet means with a layer of foam material therebetween and means connected with the outlet means for creating at least a partial vacuum in the container, the improvement comprising monitoring means for monitoring said foam material and for enabling the prevention of the accumulation of foreign material thereon, said monitoring means comprising a first means connected to the container, and electrode means centrally mounted in said first means and extending into said foam layer for monitoring the foam layer; fluid supply means in fluid-flow communication with a passage in said first means for supplying a stream of insulating fluid into said first means through said passage and through said first means around said electrode means in response to the partial vacuum in said container to prevent foreign material from accumulating on said electrode means.

4,009,011
CAPACITOR DISCHARGE OF LATCHING RELAYS AND ROTARY FILTER

Gary T. Ross, Burnsville, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 22, 1975, Ser. No. 606,825
Int. Cl.² B01D 46/00
U.S. Cl. 55—273 2 Claims

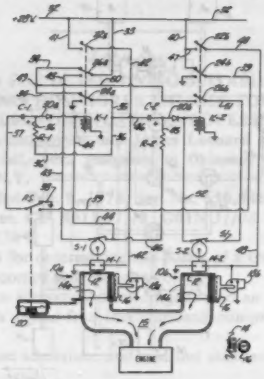
1. Circuitry for sequentially energizing first and second load devices from a direct current source, comprising:

a first relay coil (K-1) electrically associated with the first load device, and a second relay coil (K-2) electrically associated with the second load device;

first power contacts (22*a*) controlled by said coil (K-1) connecting the first load device to the current source only when said first coil (K-1) is energized; second power contacts (22*b*) controlled by said second coil (K-2) connecting the second load device to the current source only when said second coil (K-2) is energized;

means for energizing the first relay coil comprising a first capacitor (C-1) having one of its leads normally connected to ground at 38 and its other lead connected to the first relay coil, a first interruptable high resistance path including a switch (33) (34) (35) connecting the current source to the other capacitor lead only when the first relay coil is de-energized whereby the first capacitor is charged without operating the coil, a first interruptable low resistance path including a switch (40) (39) connected to the current source, and cycle-initiating switch means (P.S.) operable to disconnect the ground and connect said one capacitor lead to said low resistance path whereby a relatively large voltage is then impressed on said one capacitor lead to thus cause the capacitor to energize the first relay coil (K-1);

means for energizing the second relay coil (K-2) comprising a second capacitor (C-2) having one of its leads connected to ground through relay contacts (24*a*) only when relay coil (K-1) is energized, said second capacitor having its other lead connected to the second relay coil (K-2), a second interruptable high resistance path including a switch (33) (43) (45) supplying current from the aforementioned source to said other lead of the second capaci-

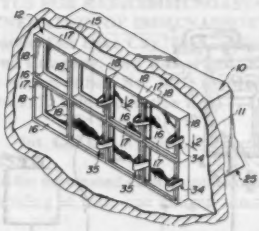


tor only when the first relay coil (K-1) is energized, a second interruptable low resistance current path including a switch (33) (34) (46) connecting the current source to said one lead of the second capacitor only when the first relay coil is de-energized, a timer switch (S-1) operable to de-energize said first relay coil (K-1) and thereby enable a relatively large voltage to be impressed through the second low resistance path onto said one lead of the second capacitor, whereby that capacitor energizes the second coil.

4,009,012
FILTER ELEMENT RETAINER CONSTRUCTION

Martin Heffler, 6202 Oxford Ave., Philadelphia, Pa. 19111

Filed Oct. 20, 1975, Ser. No. 623,573
Int. Cl.² B01D 50/00, 59/50; A44B 21/00
U.S. Cl. 55—483 9 Claims



1. In a filter bank, the combination comprising a framework including a plurality of intersecting walls defining therebetween openings for receiving filter elements, internal flange means fixed in each opening for marginally engaging one face of the received filter element, holding means removably positioned in each opening for holding engagement with the other face of the received filter element substantially completely along opposite margins thereof and facing through said oppo-

site margins toward said flange means for clamping a filter element in position, and releasable gripping means carried by said holding means for releasable gripping engagement with the walls of said framework for releasably retaining said holding means in said clamping relation.

4,009,013
PROCESS FOR THE PRODUCTION OF SLUSH OF LOW-BOILING GASES

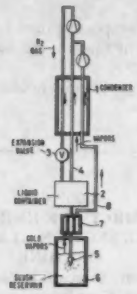
Rolf Schrawer, Bruchkobel; Josef Bardenheier, Frankfurt am Main, and Jurgen Koch, Mannheim, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed May 12, 1975, Ser. No. 576,848

Claims priority, application Germany, May 15, 1974, 2423610

Int. Cl.² F25J *1/00, 5/00*

U.S. Cl. 62—10 **5 Claims**



1. In a process for the preparation of fine-grained slush from a supply of low boiling gases which utilizes therein liquefied gas or very cold gas under high pressure, the improvement comprising relieving a portion of the gas in the supply from stress, by expansion through a nozzle alternately to a pressure below the pressure of the triple point for the formation of slush in the gas-ice region and discharging that portion from the nozzle as snow, then subsequently in 5–10 seconds isenthalpically expanding an additional portion of the gas from the supply to a pressure above the triple point in the gas-liquid region, to discharge that additional portion from the nozzle as liquid by altering the conditions within the nozzle, and continuing to quickly alternate the pressure releasing steps every 5–10 seconds with further portions of gas from the supply to create a fine-grained homogeneous snow and liquid slush mixture having a grain size of 1 mm to 3 mm.

4,009,014
OPTICAL FIBER MANUFACTURE

Philip William Black, Stansted Mountfitchet, and John Irven, Bishop's Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 3, 1975, Ser. No. 610,021

Claims priority, application United Kingdom, Sept. 5, 1974, 38826/74

Int. Cl.³ G02B *5/14*; C03C *21/00*

U.S. Cl. 65—3 A **3 Claims**

1. A method for forming an optical fiber preform for producing low mode dispersion optical fibers comprising the steps of:

depositing phosphorus pentoxide on the inner surface of a silica tube to provide a region of high index of refraction on said inner surface;

heating the phosphorus pentoxide coated tube up to a first temperature of 1400° C to diffuse the phosphorus pentoxide into the silica; and

subsequently heating the tube to a second temperature of 1700° C to collapse the tube and form the preform.

4,009,015
METHOD OF MAKING GLASS-CERAMICS FROM MODIFIED BASALTS

Howard L. McCollister, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 29, 1975, Ser. No. 600,020

Int. Cl.² C03B *32/00*

U.S. Cl. 65—33 **2 Claims**

1. The method of making a glass-ceramic having a Knoop micro hardness of at least 800, over 85 volume percent crystallinity, containing a multitude of randomly oriented, essentially homogeneously dispersed crystals, essentially all of which are less then 5 microns across in their largest lineal dimension, which comprises

1. melting under essentially non-reducing conditions a batch consisting essentially of basalt and one or more oxide (or precursor thereof) selected from CaO, MgO and SiO_2, the selection of such oxide(s) and amounts thereof being effective to result in an overall composition having the following two ratios in the indicated ranges:

$$\frac{\text{Moles } SiO_2}{\text{Moles CaO} + \text{Moles MgO} + (3/5)(\text{Moles } Fe_2O_3)} \quad \text{(I)}$$

in the range of 0.9 to 1.1, and

$$\frac{\text{Moles CaO}}{\text{Moles MgO} + (5/6)\ \text{Moles } Fe_2O_3} \quad \text{(II)}$$

in the range of 0.9 to 1.1

wherein the "Moles Fe_2O_3" represents the entire iron oxide content of the batch expressed as Fe_2O_3, including the actual Fe_2O_3 as well as the FeO present in the basalt,

2. cooling the melt to form an essentially homogeneous and essentially entirely vitreous solidified glass and

3. heating said glass according to a time and temperature schedule effective to crystallize same to said glass-ceramic having essentially no magnetite crystals and having the ratios (I) and (II) above.

4,009,016
METHOD OF MAKING GLASSWARE WITH A HIGH SPEED PRESS AND BLOW TECHNIQUE

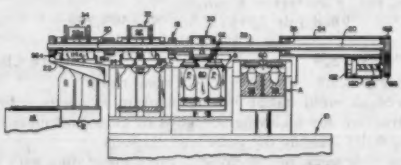
Thomas Vincent Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 462,078, April 18, 1974, Pat. No. 3,914,120. This application Aug. 18, 1975, Ser. No. 605,761

Claims priority, application United Kingdom, Nov. 23, 1973, 54389/73

Int. Cl.² C03B *7/00, 9/14*

U.S. Cl. 65—76 **4 Claims**



1. A process of forming glassware in a press and blow technique utilizing at last one upright parison mold in a first station of a forming machine section which also has two additional stations spaced apart longitudinally of the section and wherein a parison is to be initially formed at the first station for further forming at the second station and for final forming or shaping into an article of glassware at the third station, the said process comprising the steps of placing a gob of molten glass in the parison mold, closing the parts of a neck ring over said parison

mold and then thrusting a plunger through the neck ring to form a parison, removing the plunger and mold from the parison to leave it suspended by the neck ring, transferring the neck ring to the second of said stations, engaging the upper portion of the parison by first tongs at said second station to support the same for further forming while said neck ring is returned to the first station, transferring the first tongs and further formed parison to the third station, engaging the parison at the third station by second tongs to support the same for final shaping while the first tongs are returned to the second station, blowing the parison to the final shape of an article of glassware at the third station, transferring the second tongs and suspended article to a point beyond said third station, releasing said article at said point, and returning the second tongs to said third station.

4,009,017

SYSTEMS FOR TRANSFERRING HEAT THROUGH A GLASSWARE FORMING MOLD

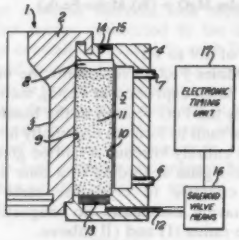
Stanley Peter Jones, Doncaster, England, assignor to Emhart (U.K.) Limited, Doncaster, England

Filed July 21, 1975, Ser. No. 597,784

Claims priority, application United Kingdom, July 22, 1974, 32311/74

Int. Cl.² C03B 9/38

U.S. Cl. 65—162 **6 Claims**



1. A glassware forming system including a forming mould and cooling means for removing heat from the forming mould, the cooling means comprising means defining a cooling chamber through which a cooling fluid may be circulated and a fluidizable bed of solid particles within a cavity located between a part of the forming mould and the cooling chamber.

4,009,018

GLASSWARE FORMING MACHINE OF THE I. S. TYPE WITH IN-LINE MOLD MOTION

Hermann Nebelung, Zurich, and Edward Charles Christopher, Zollikon, both of Switzerland, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed July 7, 1975, Ser. No. 593,752

Int. Cl.² C03B 9/00

U.S. Cl. 65—229 **18 Claims**

1. A glassware forming machine comprising

a. a blank mold station having blank mold cavity defining structure for receiving the gobs of glass and means for partially forming the gobs into parisons,

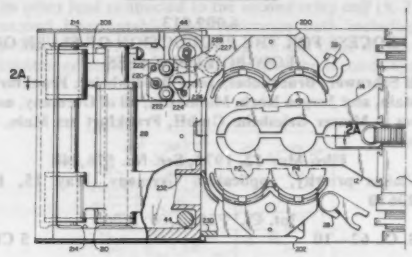
b. partible neck ring mold structures for mating with said blank mold cavity defining structure at said blank station,

c. a blow mold station horizontally spaced from said blank station in the same plane and having upwardly open blow mold cavity defining structure for receiving the partially formed parisons from said blank station,

d. transfer means for said parisons including neck ring arms associated with said partible neck ring mold structure and means pivotally supporting said arms for movement about a horizontal axis located between said blank mold and blow mold stations,

e. means defining fixed horizontally extending ways at least at one of said stations, which ways are oriented parallel to the said axis of pivotal movement for said neck ring arms,

f. said mold cavity defining structure at said one station including mold holder means movably received on said



fixed ways for supporting mold segments thereon for parallel movement toward and away from one another, and

g. means for moving said mold holder means in synchronism with one another.

4,009,019

BLOWHEAD ASSEMBLY FOR HIGH SPEED PRESS AND BLOW INDIVIDUAL SECTION GLASSWARE FORMING MACHINE

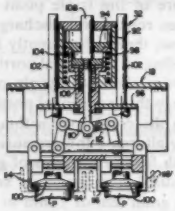
Thomas Vincent Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 462,078, April 18, 1974, Pat. No. 3,914,120. This application Aug. 18, 1975, Ser. No. 605,727

Claims priority, application United Kingdom, Nov. 23, 1973, 54389/73

Int. Cl.² C03B 9/00, 9/14

U.S. Cl. 65—261 **2 Claims**



1. A blowhead assembly for association with a multi-part glassware mold having parts adapted to engage each other to define a mold cavity and to engage a glass parison below its finish and thus to support the parison within the cavity, the said assembly comprising a cylinder supported above the mold, a first piston reciprocable in said cylinder, a blowhead connected to said first piston for movement therewith and including conduit means adapted to be closely associated with the parison finish and to introduce a gas under pressure to the interior thereof when the first piston is moved downwardly, a second piston supported by said blowhead within said cylinder for reciprocation upwardly and downwardly with the first piston, means for changing fluid pressure on one side of said second piston and thereby selectively to move it vertically toward or away from said first piston, a pair of tongs movable generally horizontally into and out of engagement with said parison beneath its upper edge and above the mold parts, and linkage elements connected between said second piston and said pair of tongs respectively to engage and disengage said tongs with the parison responsive to movement of said second piston relative to said first piston.

4,009,020

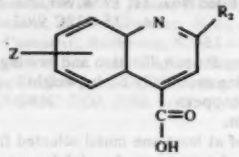
METHOD OF REGULATING PLANT GROWTH

George Robert Starke, Perkasie, and Anson Richard Cooke, Hatfield, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed May 6, 1975, Ser. No. 574,990
Int. Cl.² A01N 5/00
U.S. Cl. 71—76 56 Claims

1. A method for producing a resistance to freeze injury in a plant which comprises applying to the plant an effective amount, with respect to the plant being treated, of a compound selected from the group consisting of:

(A)



wherein Z is selected from the group consisting of:
a. hydrogen,
b. chlorine, and
c. fluorine;
R_2 is selected from the group consisting of:
a. hydrogen,
b. trifluoromethyl,
c. bromine, and
d. chlorine; and
B. agriculturally acceptable salts of (A) selected from the group consisting of:
a. alkaline earth metal salts,
b. mono-, di or tri alkylamine salts of 1 to 3 carbon atoms,
c. mono- , di or tri- alkanolamine salts of 1 to 3 carbon atoms, and
d. acid addition salts of a non-phytotoxic acid.

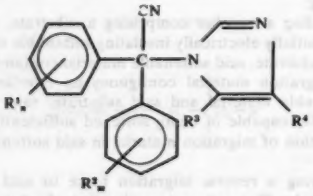
4,009,021

IMIDAZOLE PLANT GROWTH REGULATORS

Roy Y. Yih, and Pyung K. Yu, both of Doylestown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 30, 1975, Ser. No. 627,483
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 11 Claims

1. A method for regulating plant growth which comprises applying to a plant, to plant seeds, or to the locus of a plant an effective amount of a compound of the formula



wherein
R^1 is a halogen atom, a $(C_1–C_4)$alkyl group, a $(C_1–C_4)$alkoxy group, a trifluoromethyl group, or a nitro group,
R^2 is a halogen atom, a $(C_1–C_4)$alkyl group, a $(C_1–C_4)$alkoxy group, a trifluoromethyl group, or a nitro group,
R^3 is a hydrogen atom or a $(C_1–C_4)$alkyl group,
R^4 is a hydrogen atom or a $(C_1–C_4)$alkyl group,
n is 0, 1, or 2, and
m is 0, 1, or 2,
or an agronomically-acceptable acid addition salt thereof.

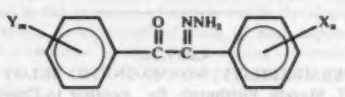
4,009,022

SELECTIVE ANTAGONISTS FOR TRIAZINE HERBICIDES

Ted Tsutomu Fujimoto, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 30, 1975, Ser. No. 627,482
Int. Cl.² A01N 9/22
U.S. Cl. 71—93 15 Claims

1. A method for reducing the phytotoxicity of a triazine herbicide selected from the group consisting of atrazine, simazine, metribuzin, ametryn, prometryne, propazine, procyazine, and terbutryn to an agronomic crop to which the triazine herbicide has been applied which comprises applying to the locus of the crop, prior to emergence of the crop, an effective amount of a compound of the formula



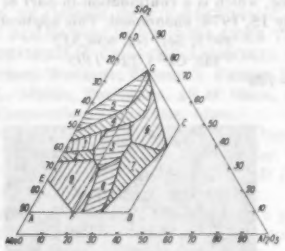
wherein
X and Y are individually halogen, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, trifluoromethyl, or nitro, and
n and *m* are 0 to 3, at a rate of about 1 to about 30 pounds per acre.

4,009,023

METHOD FOR THE REFINING OF MOLTEN METAL

Karl Erik Öberg, and Bengt Olof Sjöberg, both of Hagfors, Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Feb. 15, 1974, Ser. No. 443,160
Claims priority, application United Kingdom, Feb. 15, 1973, 7588/73
Int. Cl.² C21C 5/52
U.S. Cl. 75—12 9 Claims



1. A process for producing a steel substantially free from calcium containing inclusions which are not plastically deformable at a hot forming temperature of the steel which comprises forming a body of molten steel in a vessel having a lining in contact with the molten steel, the lining being substantially free from calcium containing compounds and from magnesium containing compounds and introducing into the body of molten steel, below the surface thereof, a slag powder, having a composition falling within the area defined by the boundaries ABCDA in the drawing, and having a melting point not higher than that of the steel and a density not higher than that of the steel, whereby the slag interacts with any inclusions in the molten steel bringing some of the inclusions to the surface of the molten steel and transforming other inclusions so that any inclusions which form in the steel on solidification are plastically deformable at hot forming temperatures.

4,009,024

PROCESS FOR REGENERATION AND REUSE OF STEELMAKING SLAG

A. Leslie Miller, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 26, 1975, Ser. No. 616,873
Int. Cl.² C21B 3/04
U.S. Cl. 75—30 15 Claims

1. A method of treating molten steelmaking slag comprising:

i. isolating molten steelmaking slag from a steel heat;

ii. simultaneously introducing sufficient oxygen and a fluid hydrocarbon fuel into the molten slag to reduce the oxides of iron, manganese, phosphorus and silicon to their elemental state to form a contaminated liquid steel; and,

iii. recovering the contaminated steel so produced.

4,009,025

LOW PERMEABILITY, NONMAGNETIC ALLOY STEEL

Robert T. Morelli, Pittsburgh, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Filed Mar. 5, 1976, Ser. No. 664,323
Int. Cl.² C22C 38/04
U.S. Cl. 75—123 B 2 Claims

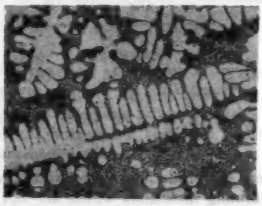
1. A stable austenitic steel characterized by low magnetic permeability in both the annealed and unannealed condition, said steel consisting essentially of, in weight percent, carbon 0.35 to 0.45, manganese 14 to 16.5, phosphorus 0.05 max., sulfur 0.07 to 0.12, silicon 0.55 to 1.15, nickel 3.5 to 5.5, nitrogen 0.12 max., chromium 0.50 max. and the balance iron and incidental impurities.

4,009,026

STRONTIUM-SILICON-ALUMINUM MASTER ALLOY AND PROCESS THEREFOR

Robert T. C. Rasmussen, Pottstown, Pa., assignor to Kawecki Berylco Industries, Inc., Reading, Pa.

Continuation-in-part of Ser. No. 500,893, Aug. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 488,667, July 15, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,333
Int. Cl.² C22C 1/03
U.S. Cl. 75—148 4 Claims



1. A process for producing a master alloy for adding a modifying amount of strontium to eutectic and hypoeutectic aluminum-silicon alloys, said process comprising adding a strontium-silicon alloy consisting essentially of:

a. between about 15 and 60 weight percent strontium;

b. between about 40 and 75 weight percent silicon; and

c. the balance incidental impurities to substantially pure aluminum at a temperature of between about 1450° and 2100° F, said strontium-silicon alloy being added in an amount to produce a strontium-silicon-aluminum master alloy containing:

a'. between about 3 and 20 weight percent strontium;

b'. between about 5 and 28 weight percent silicon; and

c'. the balance aluminum and impurities.

4,009,027

ALLOY FOR METALLIZATION AND BRAZING OF ABRASIVE MATERIALS

Jury Vladimirovich Naidich, ulitsa Vernadskogo, 85, kv. 48; Galina Alexeevna Kolesnichenko, ulitsa Prazhskoya, 3, kv. 128, both of Kiev; Leon Izrailevich Feldgun, Ligovsky prospekt, 3/9, kv. 1; Mark Simonovich Drui, ulitsa Chekhova, 4, kv. 93, both of Leningrad; Boris Dmitrievich Kostjuk, ulitsa Dobrokhotova, 21, kv. 104; Nikolai Stepanovich Zjukin, ulitsa Kurskaya, 8a, kv. 59, both of Kiev; Vladislav Sergeevich Lysanov, ulitsa Vavilovykh, 15, korpus 3, kv. 73, and Alla Alexandrovna Lavrinovich, ulitsa Shverника, 16, kv. 51, both of Leningrad, all of U.S.S.R.

Filed Nov. 21, 1974, Ser. No. 525,981
Int. Cl.² C22C 9/02
U.S. Cl. 75—154 2 Claims

1. An alloy for metallization and brazing of abrasive meteriais, consisting essentially of, by weight:

60–80% copper;

7–17% tin;

0.3–5% of at least one metal selected from the group consisting of tungsten and molybdenum;

0.003–5% tantalum;

0.5–8.16% of at least one metal selected from the group consisting of cobalt and nickel;

1.5–10% of at least one metal selected from the group consisting of lead and bismuth; and

3–15% of at least one metal selected from the group consisting of zirconium and titanium.

2. An alloy for metallization and brazing of abrasive materials, consisting essentially of, by weight;

25.2–85.7% copper;

1.8–17% tin;

0.3–35% of at least one metal selected from the group consisting of tungsten and molybdenum;

3–15% of at least one metal selected from the group consisting of titanium and zirconium;

0.5–8.16% of at least one metal selected from the group consisting of cobalt and nickel; and

1.5–10% of at least one metal selected from the group consisting of lead and bismuth.

4,009,028

REVERSAL MIGRATION IMAGING SYSTEM

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,515, March 25, 1974. This application Apr. 2, 1975, Ser. No. 564,241
Int. Cl.² G03G 5/04
U.S. Cl. 96—1 PS 1 Claim

1. A method of preparing a migration imaging member comprising:

a. providing a member comprising a substrate, a layer of substantially electrically insulating softenable material on said substrate, said softenable material containing a layer of migration material contiguous an interface of said softenable material and said substrate, said softenable material capable of being softened sufficiently to allow migration of migration material in said softenable material;

b. applying a reverse migration force to said migration material sufficient to cause migration of substantially the entire layer of migration material away from the substrate and towards the free surface of the imaging member;

c. softening the softenable layer sufficient to allow migration of substantially the entire layer of migration material away from the substrate and toward the free surface of the softenable material;

d. after step (c) applying an imagewise migration force to said migration material sufficient to cause imagewise migration of the migration material in depth in said softenable layer; and

e. developing said imaging member by softening the soften-

able material at least sufficient to allow imagewise migration of migration material at least in depth in said softenable layer.

4,009,029

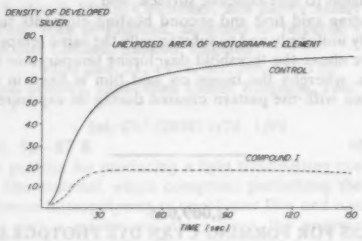
CYANOETHYL-CONTAINING BLOCKED DEVELOPMENT RESTRAINERS

Howell Allen Hammond; Wilbert Jeptha Humphlett, and Ilmari Fritiof Salminen, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 367,306, June 5, 1973, abandoned. This application June 20, 1975, Ser. No. 588,976

Int. Cl.² G03C *7/00, 5/30, 1/48, 1/40*

U.S. Cl. 96—3 **33 Claims**



27. In a process for producing a photographic transfer image comprising:

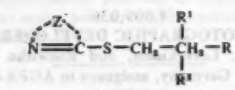
a. imagewise-exposing a photosensitive element comprising a support having thereon a layer containing a silver halide composition having associated therewith an image dye-providing material,

b. treating said photosensitive element with an alkaline processing composition to effect development of said exposed silver halide emulsion layer,

c. forming an imagewise distribution of diffusible image dye-providing material as a function of development of said silver halide emulsion layer, and

d. at least a portion of said imagewise distribution of diffusible image dye-providing material diffusing to an image-receiving layer,

the improvement wherein said silver halide emulsion has associated therewith a blocked development restrainer of the formula:



wherein Z represents the nonmetallic atoms necessary to form an uncharged nucleus which completes a 5- or 6-membered heterocyclic ring on said structure; R is a cyano group; and R^1 and R^2 can each be hydrogen atoms, alkyl groups or aryl groups.

28. A process according to claim **27** wherein said photosensitive element contains a layer containing a red-sensitive negative silver halide emulsion, a layer containing a green-sensitive negative silver halide emulsion and a layer containing a blue-sensitive negative silver halide emulsion, at least one of said layers containing silver halide emulsion having associated therewith an image dye-providing material.

4,009,030

TIMING LAYER FOR COLOR TRANSFER ASSEMBLAGES COMPRISING A MIXTURE OF CELLULOSE ACETATE AND MALEIC ANHYDRIDE COPOLYMER

Edward P. Abel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,221

Int. Cl.² G03C *7/00, 5/54, 1/40, 1/76*

U.S. Cl. 96—29 D **24 Claims**

18. In a process for producing a photographic transfer image in color comprising:

a. imagewise exposing a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;

b. treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers, said processing composition contacting said emulsion layer prior to contactig a neutralizing layer;

c. an imagewise distribution of dye image-providing material being formed as a function of development;

d. at least a portion of said imagewise distribution of dye image-providing material diffusing to a dye image-receiving layer;

e. permeating a timing layer associated with a neutralizing layer with said alkaline processing composition after a predetermined time, said timing layer being disposed between said neutralizing layer and said photosensitive silver halide emulsion layer so that said processing composition must first permeate said timing layer before contacting said neutralizing layer;

f. neutralizing said alkaline processing composition by means of said neutralizing layer associated with said photographic element after said predetermined time;

the improvement comprising employing as said timing layer a compatible mixture of cellulose acetate and a maleic anhydride copolymer to provide a clear layer, said mixture comprising about 2 to about 20% by weight of said copolymer.

4,009,031

DIFFUSION TRANSFER IMAGE-RECEIVING ELEMENT HAVING POLYVINYLPYRIDINE LAYER TREATED WITH HYDROPHILIC COLLOID/AMMONIA SOLUTION

David P. Carlson, Westboro; Thomas R. Keenan, Reading, and Douglas L. Marks, Burlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 420,134, Nov. 29, 1973, abandoned. This application June 6, 1975, Ser. No. 584,488

Int. Cl.² G03C *5/54, 7/00, 1/40;* **B44D** *1/09*

U.S. Cl. 96—29 D **17 Claims**

1. An image-receiving element for use in a photographic diffusion transfer color process which comprises, in sequence:

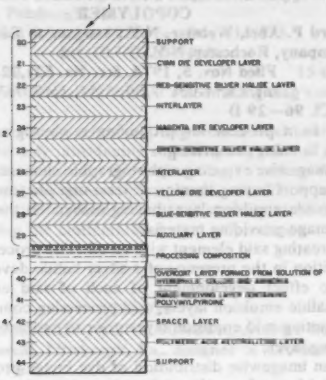
a support;

an image-receiving layer comprising polyvinylpyridine on one surface of said support; and

an overcoat on said image-receiving layer, said overcoat formed, after drying of said image-receiving layer, by coating said image-receiving layer with an aqueous solution comprising a hydrophilic colloid and ammonia.

13. In a process for forming a diffusion transfer dye image wherein an aqueous alkaline processing composition is applied to an exposed photosensitive element which includes a silver halide emulsion having associated therewith a dye developer, thereby effecting development of exposed silver halide, and an imagewise distribution of mobile dye developer is formed which is transferred at least in part, to a superposed image-receiving element having an image-receiving layer comprising polyvinylpyridine, to impart thereto a dye image, and said image-receiving element is separated from contact with said processing composition subsequent to the formation of said dye image, the improvement which comprises:

employing an image-receiving element as defined in claim



4,009,032

PROCESS FOR PREPARING WATERLESS PRINTING MASTERS COMPRISING COPOLYMER OF SILOXANE AND THERMOPLASTIC BLOCKS

Richard L. Schank, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1974, Ser. No. 517,347
Int. Cl.² G03F 7/02; G03G 13/14
U.S. Cl. 96—33 **11 Claims**

1. A method of preparing a printing master comprising coating a master substrate with a copolymer having from 50–99% by weight siloxane blocks which are curable to an elastomeric ink releasable condition and organic ink accepting blocks which are thermoplastic when heated,

selectively curing the siloxane blocks so as to render the polymer ink releasing but wherein the organic thermoplastic blocks are substantially uncrosslinked, depositing an ink accepting particulate material on said master in image configuration, and heating said coating to soften the organic thermoplastic blocks and allowing the coating to cool so as to bond the particulate imaging material to the master.

4,009,033

HIGH SPEED POSITIVE PHOTORESIST COMPOSITION

Peter Bakos, and John Rasile, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,636
Int. Cl.² G03C 1/54; G03F 7/08
U.S. Cl. 96—33 **12 Claims**

1. A positive photoresist composition developable in an alkaline solution comprising an admixture of a resin, a light-sensitive or electron beam-sensitive 1, 2-quinone-diazide sulfonic acid ester sensitizer and an acid compound selected from the group consisting of picric acid, nicotinic acid and nitrocinnamic acid in admixture characterized by increased sensitivity to light or electron beams as a result of the presence of said acid compound wherein said acid compound is present in an amount such that satisfactory image resulution is obtained.

4,009,034

DRY FILM PROCESSING

Joseph N. May, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 377,887, July 9, 1973, Pat. No. 3,902,041.
This application Feb. 18, 1975, Ser. No. 550,302
Int. Cl.² G03C 5/24, 1/02
U.S. Cl. 96—48 HD **3 Claims**

1. A process for developing a discrete area of an extended exposed dry film having a heat developable emulsion placed upon a support material including the following steps in sequence:

a. positioning said discrete area of the support side of said film in tension and in contact with a convex surface of a first heating element, said convex surface disposed in spaced face-to-face relationship with a concave surface of a second heating element to define therewith a developing cavity,

b. effecting relative movement of said heating elements in a direction to narrow said cavity and to place the exposed emulsion side of said film into close non-contiguous relationship to said concave surface, and

c. heating said first and second heating elements substantially uniformly and to substantially the same temperature at or above the threshold developing temperature of said film, whereby the image on said film is fixed in accordance with the pattern created during its exposure

4,009,035

PROCESS FOR FORMING CYAN DYE PHOTOGRAPHIC IMAGES

Tamotsu Kojima; Shui Sato; Takaya Endo; Tugumoto Usui, and Tomio Horiuchi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1975, Ser. No. 543,044
Claims priority, application Japan, Jan. 25, 1974, 49-10787
Int. Cl.² G03C 7/00, 1/40
U.S. Cl. 96—55 **3 Claims**

1. A process for forming a cyan dye photographic image, which comprises bringing a monohydro-polyfluoroalkylcarbonamido compound of the formula

$$A - NHCO(CF_2CF_2)_nH$$

wherein A is a phenolic or naptholic cyan coupler residue and n is a positive integer of 1 to 7, into contact with exposed silver halide crystals in the presence of an aromatic primary amine type color developing agent for said silver halide crystals.

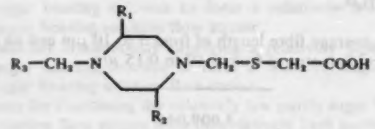
4,009,036

PHOTOGRAPHIC DEVELOPER

Manfred Becker, Leverkusen, and Roswitha Ullrich, Burscheid, both of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Germany

Filed Dec. 9, 1974, Ser. No. 530,871
Claims priority, application Germany, Dec. 13, 1973, 2361947
Int. Cl.² G03C 5/30
U.S. Cl. 96—66.3 **6 Claims**

1. An aqueous alkaline photographic black- and white developer solution containing at least one o- or p-N-hydroxyethylaminophenol developer substance for developing exposed photographic materials which contain at least one silver halide emulsion layer in which the silver halide consists substantially of silver bromide, the improvement which comprises containing in said solution for development retardation at least one piperazine derivative of the formula



wherein

R_1 and R_2 which may be the same or different represent hydrogen or methyl and

R_3 represents hydrogen, $-S-CH_2-COOH$ or a photographically inert group stable in alkaline solution selected from the class consisting of an alkyl, cycloalkyl, aralkyl, aryl or heterocyclic group

in an amount of from 0.3 to 30 m Mol per liter.

4,009,037

COATED SYNTHETIC FILM MATERIALS

David Roderick Mann, Colchester, and James Albert Barker, Ipswich, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 21, 1974, Ser. No. 435,175

Claims priority, application United Kingdom, Feb. 1, 1973, 5089/73

Int. Cl.² G03C *1/78, 1/96*

U.S. Cl. 96—87 R **10 Claims**

1. A process for producing a light transmitting coated synthetic film material, which comprises pretreating the surface of a styrene homopolymer or copolymer film and coating said surface with a gelatin-containing layer, the pretreating step consisting of treating the film surface with a solvent for the film without whitening so as to make said film surface porous to said gelatin-containing layer thereby enabling said gelatin-containing layer to penetrate into said film to a greater depth than when said film is not treated with a solvent, drying the solvent, and subsequently corona discharge treating the solvent treated surface.

10. A light transmitting coated synthetic film produced according to the process of claim 1.

4,009,038

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Atsuaki Arai; Reiichi Ohi; Minoru Yamada; Kenji Yokoo, and Hiroshi Hara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 23, 1975, Ser. No. 580,272

Claims priority, application Japan, May 23, 1974, 49-58271

Int. Cl.² G03C *1/40, 1/84*

U.S. Cl. 96—100 **13 Claims**

1. A silver halide color photographic material comprising a support having thereon at least a silver halide emulsion layer containing a hydrophobic phenolic or naphtholic cyan dye-forming coupler and at least one 2-(2′-hydroxyphenyl)-benzotriazole compound.

4,009,039

HEAT DEVELOPABLE LIGHT-SENSITIVE OXAZOLINE CONTAINING ELEMENT

Takao Masuda, and Nobuyoshi Sekikawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

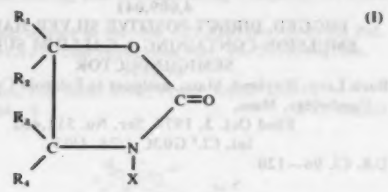
Filed Aug. 18, 1975, Ser. No. 605,700

Claims priority, application Japan, Aug. 19, 1974, 49-94847

Int. Cl.² G03C *1/02, 1/34*

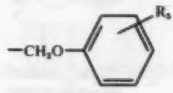
U.S. Cl. 96—114.1 **6 Claims**

1. A heat developable light-sensitive element comprising a support having therein or in at least one layer thereon (a) an organic silver salt, (b) a light-sensitive silver halide or a compound capable of forming a light-sensitive silver halide upon reaction with the organic silver salt, (c) a reducing agent and (d) an oxazolinone compound represented by the following general formula (I):



(I)

wherein R_1, R_2, R_3 and R_4 each is a hydrogen atom; an alkyl group having 1 to 22 carbon atoms; a haloalkyl group having 1 to 22 carbon atoms; an amino group; a hydroxyalkyl group having 1 to 22 carbon atoms; an allyl group; a naphthyl group; a benzyl group; a



group in which R_5 is a hydrogen atom, a halogen atom, an alkyl group, an alkylthio group, an amino group or an alkylamino group; a benzyloxy group; an aryl group; a haloaryl group; an alkylaryl group; an alkoxyaryl group; an $-OR_6$ group in which R_6 is hydrogen atom, an alkyl group, an allyl group, an aryl group or an alkoxyaryl group; a

group in which R_7 and R_8 each is a hydrogen atom, an alkyl group, an aryl group or an allyl group; a cyclohexyl group; a $-CH_2OR_9$ group in which R_9 is a naphthyl group; or a $-CH_2R_{10}$ in which R_{10} is a morpholino group, a piperadino group or an alkylthio group; and X is a hydrogen atom, a chlorine atom or a bromine atom.

4,009,040

HEXAARYLBIIMIDAZOLE POLYMERS

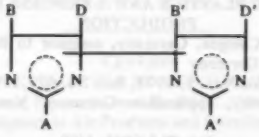
William John Nebe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 480,408, June 18, 1974, abandoned. This application May 21, 1975, Ser. No. 579,601

Int. Cl.² G03C *1/68;* **C08F** *2/46*

U.S. Cl. 96—115 R **18 Claims**

1. A film forming polymer containing a plurality of hexaarylbiimidazole groups of the formula



incorporated in the main chain or a cross-linking side chain of the polymer through one A, B or D group and through one A′, B′ or D′ group wherein

A, B, D, A′, B′ and D′ individually are aryl groups of 6–12 ring atoms substituted with up to one or more of fluorine, chlorine, bromine, cyano, nitro, phenylthio, or alkyl,

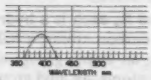
alkoxy, acyloxy, acylamido, alkylthio or dialkylsulfamoyl group each having 1–6 carbon atoms.

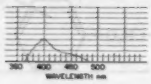
4,009,041

FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSION CONTAINING A GALLIUM SULFIDE SEMICONDUCTOR

Boris Levy, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1974, Ser. No. 511,462
Int. Cl.² G03C *1/28, 1/02*
U.S. Cl. 96—120 **6 Claims**





1. A direct positive photosensitive element which comprises a particulate dispersion of fogged silver halide crystals, adapted to discharge the fog upon exposure of said crystals to incident electromagnetic radiation actinic thereto, having in contact therewith in electron accepting relationship a particulate dispersion of gallium sulfide semiconductor adapted to accept electrons from said silver halide crystals as a function of said exposure of said crystals to said incident electromagnetic radiation actinic thereto.

4,009,042

TRANSPARENT, INFRA-RED TRANSMITTING GLASS-CERAMICS

Hermann L. Rittler, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,475
Int. Cl.² C03C *3/22, 3/04*
U.S. Cl. 106—39.7 **1 Claim**

1. A transparent glass-ceramic article exhibiting a coefficient of thermal expansion (R.T. to 300° C.) less than about 10 $\times 10^{-7}$/° C., excellent detergent durability, an infra-red transmittance at a wavelength of 3.5 microns through a polished plate of about 4 mm. thickness greater than 40%, and wherein the crystal phase consists essentially of beta-quartz solid solution, which consists essentially, by weight on the oxide basis, of about 3–4% Li_2O, 20–30% Al_2O_3, 50–65% SiO_2, 3–7% TiO_2, 1.5–3% ZrO_2, and 2-5% P_2O_5, and wherein additional alkali metal oxides, the alkaline earth metal oxides, and B_2O_3 are essentially absent.

4,009,043

REINFORCED PLASTICS AND A PROCESS FOR THEIR PRODUCTION

Lothar Preis, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Nov. 5, 1975, Ser. No. 629,105
Claims priority, application Germany, Nov. 15, 1974, 2454221
Int. Cl.² C08L *1/00*
U.S. Cl. 106—204 **5 Claims**

1. Moulding compositions containing 60 to 90% by weight of a thermoplastic or thermosetting polymer or a mixture thereof, 5 to 30% by weight of carbon fibres with an average fibre length of from 200 to 1,000μm and an average fibre diameter of from 6 to 10 μm and 5 and 30% by weight of potassium titanate whiskers of the formula

$K_2Ti_4O_{12}$,

with an average fibre length of from 5 to 10 μm and an average fibre diameter of from 0.10 to 0.15 μm.

4,009,044

ADHESIVE COMPOSITION

Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Antonina Mikhailovna Polyakova, ulitsa Vavilova, 55/7, kv. 54; Kira Alexandrovna Mager, Beskudnikovsky bulvar, 10, korpus 11, kv. 44, and Vyacheslav Nikolaevich Semyantsev, ulitsa Gorkogo, 28, kv. 6, all of Moscow, U.S.S.R.

Filed Mar. 7, 1975, Ser. No. 556,538
Int. Cl.² C09K *3/00*
U.S. Cl. 106—287 R **4 Claims**

1. An adhesive composition containing monomeric -α-cyanacrylates selected from the group consisting of alkyl-α-cyanacrylates, wherein alkyl group contains from 1 to 7 carbon atoms, and allyl-α-cyanacrylate, as well as a modifying additive selected from the group of monomeric fluorinated acrylates consisting of fluorinated methacrylate and fluorinated acrylate of the general formula

$$CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}{-}COOCH_2(CF_2{-}CF_2)n\,H,$$

wherein n=1–3, R is H, CH_3,

and

$$CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}{-}COOCH_2(CF_2)n_1CF_2,$$

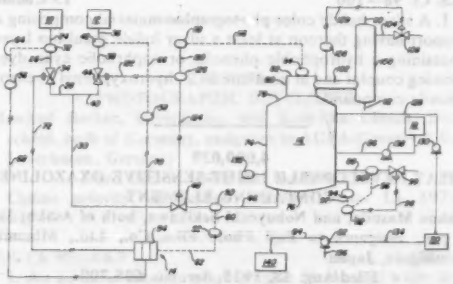
wherein n_1=1–2, and R has the above-mentioned significances, monomeric α-cyanacrylates being used in an amount of 70–90 w.% and the modifying additive in an amount of 10–30 w.%.

4,009,045

CONTINUOUS CRYSTALLIZATION PROCESS AND APPARATUS

Peter H. Petri, LaPlace, La., assignor to Godchaux-Henderson Sugar Co., Inc., Denver, Colo.

Filed Apr. 21, 1976, Ser. No. 678,937
Int. Cl.² C13F *1/02;* C13G *1/06*
U.S. Cl. 127—16 **13 Claims**



1. An apparatus for continuously crystallizing sugar from a sugar bearing solution formed as a mixture of a relatively low purity sugar bearing solution and a relatively high bearing sugar solution, comprising:

a single stage vacuum pan means for continuously boiling a sugar bearing solution and sugar seed crystals at a regulated temperature and pressure to form a massecuite,

means for continuously supplying a relatively low purity sugar bearing solution to form a relatively low purity sugar bearing solution flow stream,

means for continuously supplying a relatively high purity sugar bearing solution to form a relatively high purity sugar bearing solution flow stream,

means for combining the relatively low purity sugar bearing solution flow stream with the relatively high purity sugar bearing solution flow stream to form a mixture of the relatively low purity sugar bearing solution and the relatively high purity sugar bearing solution in a combined flow stream,

a purity control means for controlling the purity of the sugar bearing solution in the combined flow stream by regulating the ratio of the rate of flow of the relatively low purity sugar bearing solution flow stream to the rate of flow of the relatively high purity sugar bearing solution flow stream into the combined flow stream,

means for supplying the combined flow stream to the vacuum pan at a regulated rate,

a sugar seed crystal supply means for supplying sugar seed crystals to the vacuum pan means at a regulated rate,

means for removing at least a portion of the massecuite from the vacuum pan means at a regulated rate to maintain a constant level of massecuite in the vacuum pan means, and

means for continuously separating product sugar crystals from the removed massecuite.

4,009,046

PROCESS FOR TREATING SUGAR-FACTORY MOLASSES

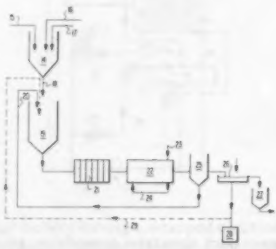
Romain Gustave Edgard Vandewijer, and Joseph Theo Degeest, both of Kumtisch, Vissenaken, Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

Filed Nov. 8, 1974, Ser. No. 522,175

Claims priority, application Belgium, Nov. 8, 1973, 807063

Int. Cl.² C13J *1/04*

U.S. Cl. 127—47 **6 Claims**



1. In a process for cold treatment of sugar-factory molasses including diluting the molasses with cold water, adding quicklime to the diluted molasses, precipitating a saccharose-lime combination from the molasses and then filtering the molasses, the improvement which comprises adding an electrolyte selected from the group consisting of $CaCl_2$, $Ca(NO_3)_2$, NaCl, $MgCl_2$, and Na citrate in an amount of at least 50 meqv. per 100 g of the saccharose in the molasses prior to or during one of the steps of dilution, addition of quicklime, and precipitation.

4,009,047

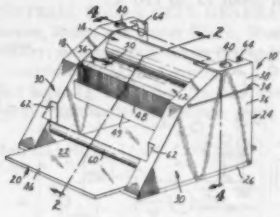
METHOD AND DEVICE FOR CLEANING SHEETS

Thomas W. Lindsay, St. Anthony Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 421,326, Dec. 3, 1973, Pat. No. 3,914,817. This application Nov. 19, 1974, Ser. No. 525,098

Int. Cl.² B08B *6/00, 11/00;* **G03D** *15/00*

U.S. Cl. 134—9 **17 Claims**



1. A device for cleaning foreign particles from at least one surface of a sheet, comprising:

a frame;

a cleaning roller rotatably mounted on said frame and comprising a layer of elastic, resilient polymeric material defining for the cleaning roller a cylindrical peripheral surface with a high surface tack adapted to transfer foreign particles from a said sheet to the peripheral surface of the roller upon contact and subsequent separation therebetween while affording clean separation between the sheet and the peripheral surface;

means adapted for defining a path for a said sheet past said cleaning roller with said one surface moving generally tangentially across and in rolling contact with the peripheral surface of said cleaning roller in a direction generally normal to its axis, including means adapted for biasing the sheet to slightly compress the layer of tacky material on the roller when in contact therewith, whereby foreign material on the surface of the sheet will transfer to the tacky peripheral surface of the cleaning roller;

a roller cleaning member having a contact surface with a width about the same as the width of said peripheral surface defining said sheet path, a length at least as long as the circumference of said cleaning roller, and with a greater surface tack with respect to foreign particles than said peripheral surface adapted to transfer said foreign particles from the peripheral surface of said cleaning roller to said contact surface upon contact and subsequent separation therebetween while affording clean separation between said cleaning roller and said contact surface; and

means adapted for moving said contact surface longitudinally over said cleaning roller with rolling contact therebetween for a distance at least equal to the circumference of said cleaning roller to transfer foreign particles on the cleaning roller to the roller cleaning member.

4,009,048

SOLVENT CLEANING AND RECOVERY PROCESS

Bruce E. Jensen, Pensacola, and Jimmie G. Tolar, Milton, both of Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed July 11, 1975, Ser. No. 595,134

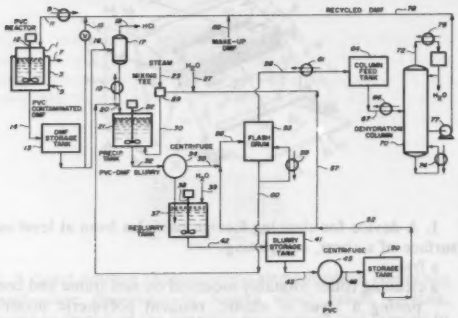
Int. Cl.² B08B *3/08, 3/10*

U.S. Cl. 134—12 **17 Claims**

1. In a process for solvent cleaning polymerization reaction equipment to remove vinyl halide polymers from the internal surfaces thereof which comprises contacting said internal surfaces with a solvent for said vinyl halide polymers heated to

an elevated temperature, said solvent having an atmospheric boiling point above 100° C, and removing a solution containing the vinyl halide polymers dissolved in said solvent from said reaction equipment, the improvement which comprises the steps of:

1. contacting said solution with steam in a vessel to precipitate substantially all of the vinyl halide polymers from said solution to form a first slurry comprising said vinyl halide polymers in an aqueous solution of said solvent and water, said first slurry containing greater than about 6% by weight water and having a temperature within the range of about 75° to 120° C.



2. cooling said first slurry from step (1) to a temperature less than the highest temperature obtained during step (1) sufficient to form a crumbly precipitate,

3. separating the cooled first slurry from step (2) into a first aqueous solvent solution and a precipitate,

4. adding water to said precipitate from step (3) with agitation to form a second slurry,

5. separating said second slurry into a second aqueous solvent solution and vinyl halide polymers, and

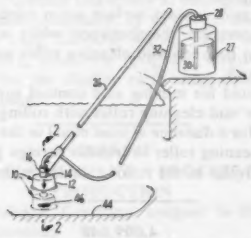
6. dehydrating at least one of said aqueous solvent solutions to recover said solvent.

4,009,049

STAIN REMOVER FOR SWIMMING POOLS, APPARATUS AND METHOD

Andrew L. Pansini, 200 Golden Gate Ave., Belvedere, Calif. 94920

Filed May 15, 1975, Ser. No. 577,900
Int. Cl.² B08B *5/04*
U.S. Cl. 134—21 **6 Claims**



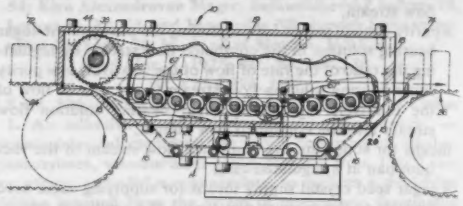
1. Stain remover apparatus for swimming pools comprising a bowl member open at its lower end and adapted to enclose and isolate a pool wall stain area, enclosure means associated with said bowl member defining a chamber for a stain remover liquid, a passageway interconnecting said chamber and the interior of said bowl member, and valve means to selectively open and close said passageway, said valve means including means automatically operable responsive to the bringing into engagement of said bowl member with the pool floor to open said passageway and automatically operable responsive to the removal of said bowl member from engagement with the pool floor to close said passageway.

4,009,050

TRANSFER MECHANISM

Arnold D. Beyer, Newark, and Harry X. Tjon, Fremont, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 18, 1975, Ser. No. 642,023
Int. Cl.² B08B *3/04*
U.S. Cl. 134—66 **22 Claims**



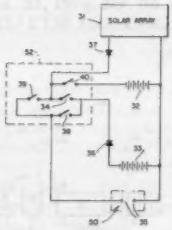
1. An article transfer device of the type described comprising the combination of a trough, an article supporting endless surface means disposed in the trough, portions of said surface means being located at selected levels in the trough and providing inclined trough entry and exit ramps, means for effecting movement of said endless surface means so as to provide a forward motion to articles such as can bodies supported in an upright and inverted position on the said endless surface means and a passage of said articles through said trough, means for introducing a liquid medium into said trough and for circulating said medium in the trough and means for controlling the level of said liquid medium in and the circulation of said liquid medium through said trough whereby said liquid medium can be brought into contact with the lower extremities of the articles located in the trough but without adversely affecting the normal upright position of the said articles.

4,009,051

SOLAR POWER PACK APPARATUS

Earle W. Kazis, Rye, N.Y.; Robert Mark, Deerfield Beach, Fla., and Thomas J. Wetherell, New York, N.Y., assignors to General Solar Power Corporation, New York, N.Y.

Filed Feb. 10, 1976, Ser. No. 656,862
Int. Cl.² H01M *10/00*
U.S. Cl. 320—15 **9 Claims**



1. Solar power pack apparatus comprising: photovoltaic cell means; first electrochemical cell battery means in circuit with said photovoltaic cell means; second electrochemical cell battery means having a watthour capacity sufficient to increase the watthour capacity of said first electrochemical cell battery means when said second electrochemical cell battery means is electrically coupled to said first electrochemical cell battery means; electrical coupling means operative to selectively couple said first and second electrochemical cell battery means; and electrical load terminal means adaptable for connection thereto of an electrical load in circuit with said electrical coupling means.

4,009,052
CHALCOGENIDE BATTERY

M. Stanley Whittingham, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 552,599, Feb. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 396,051, Sept. 10, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 673,696

Int. Cl.² H01M 35/02

U.S. Cl. 429—191 24 Claims

1. A battery comprising:

a. an anode containing as the anode-active material a metal selected from the group consisting of Group *Ia* metals, Group *Ib* metals, Group *IIa* metals, Group *IIb* metals, Group *IIIa* metals, Group *IVa* metals, and mixtures containing the aforesaid metals such that the aforesaid metals can be electrochemically released from the mixtures;

b. a cathode with a sole cathode-active material consisting essentially of

1. a layered chalcogenide of the formula MZ_x wherein M is an element selected from the group consisting of titanium, zirconium, hafnium, niobium, tantalum and vanadium; Z is an element selected from the group consisting of sulfur, selenium and tellurium, and x is a numerical value between about 1.8 and about 2.05 or (2) alloys of the aforesaid chalcogenides with one another, said chalcogenides having a structure which will permit intercalation therein by ions of the anode-active material; and

c. an electrolyte which does not chemically react with said anode or said cathode and which will permit the migration of ions from said anode-active material to intercalate said cathode-active material.

4,009,053
WRAPPED-ELECTRODE BATTERY

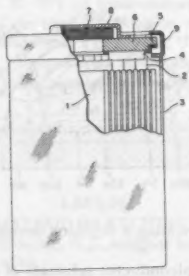
Gerd Schenk, Iserlohn, and Heinz Haake, Rummenohl, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed June 16, 1975, Ser. No. 587,165

Claims priority, application Germany, Aug. 9, 1974, 2438296

Int. Cl.² H01M 2/30

U.S. Cl. 429—94 3 Claims



1. In a storage battery having a wrapped electrode, a current take-off conductor contacting the rim of the eletrode, and a conductive lid contacting the conductor, the improvement wherein

the current take-off conductor is a generally circular plate having a plurality of radial slots extending between a solid inner annular portion and a solid outer annular portion,

the slots having confronting radial edges turned out of the plane of the plate and extending across consecutive turns of the wrapped electrode and engaging the adjacent rim of the electrode,

the conductive lid being of annular shape and resting directly on the take-off conductor plate and extending radially from the inner to the outer solid portion of the plate, and

means are provided for pressing the lid against the conductor plate through closure of the battery, whereby conductive connection is established between the plate and the lid.

4,009,054
TERRESTRIAL SOLAR CELL GENERATOR

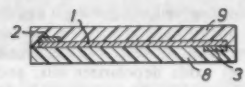
Hans Gochermann, Holm, and Dieter Rüsch, Wedel, Holstein, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 23, 1975, Ser. No. 616,036

Claims priority, application Germany, Sept. 25, 1974, 2445642

Int. Cl.² H01L 31/04; C03C 27/10

U.S. Cl. 136—89 P 8 Claims



1. In a terrestrial solar cell generator including a plurality of solar cells, a plurality of leads electrically connecting said solar cells to one another, and a transparent housing for said solar cells; the improvement wherein said housing is entirely formed of the same radiation resistant glass fiber reinforced plastic material and encapsulates said solar cells and said connecting leads on all sides, whereby a terrestrial sollar cell generator with improved thermal stress properties and whose solar cells are protected against adverse enviromental influences is provided.

4,009,055
APPARATUS FOR PRODUCING ELECTRICITY IN CASE OF FIRE

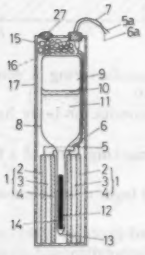
Akinobu Fujiwara, 3204 Shimohatsukari Hatsukaricho, Otsuki, Yamanashi, Japan

Filed June 3, 1975, Ser. No. 583,396

Claims priority, application Japan, July 15, 1974, 49-81557

Int. Cl.² H01M 6/30

U.S. Cl. 429—112 15 Claims

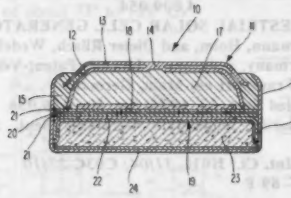


1. An apparatus for producing electricity in case of a fire, comprising a housing, water-activated cell element, and a normally sealed vessel of breakable material containing an amount of activation electrolyte therein and having tubular capillary means of breakable material integrally thereof and disposed close to said cell element, said tubular capillary means having thermo-sensitive element of bendable material therein.

4,009,056
PRIMARY ALKALINE CELL HAVING A STABLE DIVALENT SILVER OXIDE DEPOLARIZER MIX

El Sayed Megahed; Carol Ruth Buelow, both of Madison, and Patrick Joseph Spellman, Middleton, all of Wis., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 15, 1976, Ser. No. 666,655
Int. Cl.² H01M 6/06
U.S. Cl. 429—126 18 Claims

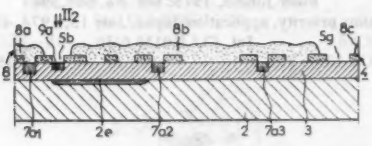


1. A primary alkaline cell comprising a negative electrode, a divalent silver oxide depolarizer mix containing divalent silver oxide, a separator between said negative electrode and said divalent silver oxide depolarizer mix, and an aqueous alkaline electrolyte, said divalent silver oxide depolarizer mix being surrounded by a reduced layer formed by treating said depolarizer mix with a mild reducing solution, and a layer of silver on the surface of the reduced layer adjacent to the separator, whereby the cell is characterized by the stability of the depolarizer mix in the alkaline electrolyte, a maximum open circuit voltage of about 1.75 volts and a single voltage plateau during discharge.

4,009,057
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Michel de Brebisson, Caen; Alain Gerard Monfret, Echirolles Village, and Jean-Michel Decrouen, Argences, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 22, 1975, Ser. No. 598,015
Claims priority, application France, Aug. 12, 1974, 74.27905
Int. Cl.² H01L 21/265
U.S. Cl. 148—1.5 12 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:

a. providing a semiconductor body having a substantially flat surface,

b. providing a first masking layer of a first material on said surface,

c. forming from said layer a basic mask having at least one window,

d. providing a second layer of a second material, parts of said second layer being disposed on said first material and at least a part thereof being present on said semiconductor surface within said window,

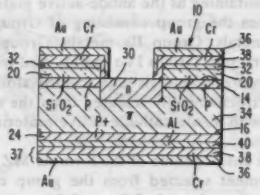
e. removing said first material together with the parts of said second material present thereon so that an island of said second material remains on the semiconductor surface and is present only within the circumference of said window, and

f. providing a further mask utilizing said island as an alignment feature related to said basic mask.

4,009,058
METHOD OF FABRICATING LARGE AREA, HIGH VOLTAGE PIN PHOTODIODE DEVICES

Mark Philip Mills, Carleton Place, Canada, assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 587,360, June 16, 1975, abandoned. This application Jan. 26, 1976, Ser. No. 652,226
Int. Cl.² H01L 21/265
U.S. Cl. 148—1.5 12 Claims



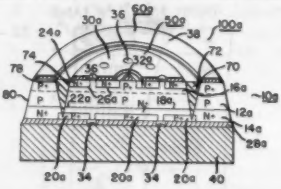
1. In a method of fabricating a PIN photodiode device having a body of intrinsic silicon semiconductor material with a resistivity in the range of 5,000 to 30,000 Ω-cm, a large incident surface area, and capable of operating in a reverse bias voltage in the range of 150 to 400 volts, the step of:

doping said body with an N-type dopant source of a minimum dopant concentration of about 10^{16} atoms per square centimeter without causing lattice damage to the surface of said PIN photodiode body.

4,009,059
REVERSE CONDUCTING THYRISTOR AND PROCESS FOR PRODUCING THE SAME

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 367,430, June 6, 1973, Pat. No. 3,914,782. This application Apr. 15, 1975, Ser. No. 568,287
Claims priority, application Japan, Jan. 8, 1972, 47-57193
Int. Cl.² H01L 21/22
U.S. Cl. 148—187 2 Claims



1. A process fabricating a thyristor device, comprising the steps of:

a. providing a semiconductor substrate of a first conductivity type and having a pair of opposed major surfaces;

b. diffusing impurity atoms of said first conductivity type into said semiconductor substrate to form a region in said substrate at one of said major surfaces and extending into said substrate and which is higher in impurity concentration than the remainder of said substrate;

c. diffusing impurity atoms of a second conductivity into said semiconductor substrate to form a region in said substrate at the other of said major surfaces and extending into said substrate and which has a conductivity type opposite that of said substrate;

d. diffusing impurity atoms of said second conductivity type into the region of high impurity concentration of said first conductivity type to form a surface region of said second conductivity type extending from said one of said major

surfaces into said region of high impurity concentration and forming therewith a PN junction, said surface region of said second conductivity type being formed to expose portions of said high impurity concentration region which extend to said one of said major surfaces of said substrate; and

e. diffusing impurity atoms of said first conductivity type into said region of said second conductivity type at said other of said major surfaces to form thereat and extending into said region of said second conductivity type a second surface region of said first conductivity type and forming therewith a PN junction, said second surface region being formed to expose portions of said region of said second conductivity type which extend to said other of said major surfaces of said substrate.

4,009,060

PRIMER COMPOSITION FOR USE WITH EXPLOSIVE CHARGES

Harold F. Bluhm, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Sept. 12, 1975, Ser. No. 613,032
Int. Cl.² C06B *25/32, 25/08*
U.S. Cl. 149—93 **9 Claims**

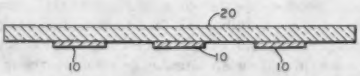
1. A homogeneous primer composition of uniform sensitivity for use with explosive charges consisting of about 50% by weight of the total composition of a nitrotoluene blend of 20–50%, dinitrotoluene (DNT) having a melting point of about 69° C. with 50–80% of trinitrotoluene of about 80° C., and about 50% of the total composition of finely granulated pentaerythritol tetranitrate (PETN) of 120–150 mesh size which remains in suspension in the nitrotoluene blend after being mixed with the nitrotoluene blend.

4,009,061

ETCHANT AND METHOD OF ETCHING TIN OXIDE FILM

Paul W. Simon, Millington, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 14, 1975, Ser. No. 604,649
Int. Cl.² B29C *17/08*; C23F *1/02*
U.S. Cl. 156—635 **6 Claims**



1. The method of etching tin oxide films comprising the steps of

providing an etchant made up of a solution of chromium metal in hydrochloric acid to form chromous ions, and

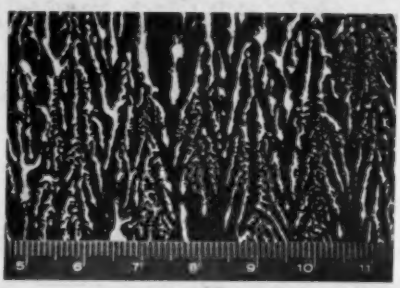
dipping a plate carrying a film of tin oxide in said etchant.

4,009,062

GYPSUM WALLBOARD — MAKING PROCESS AND PRODUCT

William J. Long, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 491,097, July 23, 1974, which is a continuation of Ser. No. 221,324, Jan. 27, 1972, abandoned.
This application May 2, 1975, Ser. No. 574,159
Int. Cl.² B32B *31/12*
U.S. Cl. 156—39 **7 Claims**



1. A process for producing gypsum wallboard comprising the following steps:

a. providing at least one paper cover sheet having a bond liner and applying a coating of a non-migratory raw starch adhesive by calendering to provide a pattern having said starch adhesive at limited areas of said bond liner while leaving substantial areas free of said starch adhesive,

b. casting an aqueous slurry of calcium sulfate hemihydrate on said paper cover sheet over said bond liner with the water from said aqueous slurry establishing wet bonding between said slurry and the uncoated portions of said bond liner, and

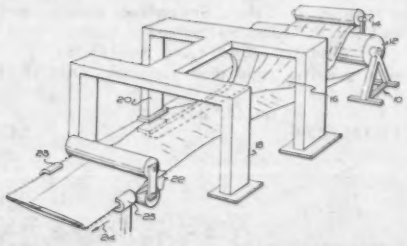
c. setting said slurry to form a core and setting said starch adhesive to establish an adhesive bond between said core and said paper cover sheet at the limited areas containing said starch adhesive.

4,009,063

METHOD OF LINING A PIPE

Eric Wood, Ossett, England, assignor to Insituform (Pipes and Structures) Limited, Horbury Junction, near Wakefield, England

Continuation of Ser. No. 282,071, Aug. 21, 1972, abandoned.
This application Jan. 29, 1975, Ser. No. 544,879
Int. Cl.² E03B *7/00*
U.S. Cl. 156—71 **19 Claims**



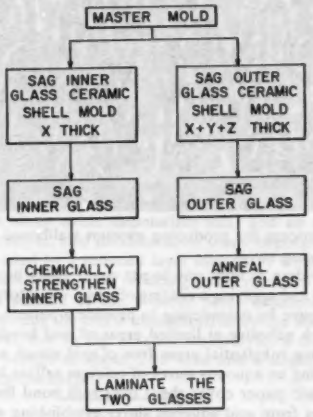
1. A method of lining a surface at least partially defining a passageway wherein a laminate of non woven felt sandwiched between an outer membrane and an inner membrane of plastics sheet material is urged by fluid pressure so that said outer membrane lies against said surface, said method including the additional steps of totally impregnating the felt with an un-

cured thermosetting resin so as to completely immerse the felt in the resin, and curing the resin while the laminate is held against such surface so as to form a hard, cured and selfsupporting resin lining having embedded felt reinforcement.

4,009,064
METHOD OF FORMING LAMINATED CURVILINEAR GLASS SHEET

Wendell C. Andrews, Mesa, Ariz., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,697
Int. Cl.² B32B *17/00;* **C03B** *11/00*
U.S. Cl. 156—102 **7 Claims**

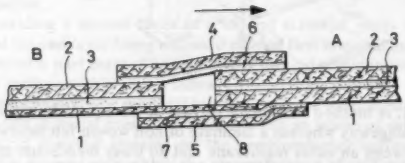

MASTER MOLD
SAG INNER GLASS CERAMIC SHELL MOLD X THICK
SAG OUTER GLASS CERAMIC SHELL MOLD X+Y+Z THICK
SAG INNER GLASS
SAG OUTER GLASS
CHEMICIALLY STRENGTHEN INNER GLASS
ANNEAL OUTER GLASS
LAMINATE THE TWO GLASSES

1. A method of forming a laminated curvilinear article from glass sheet which comprises, forming a master mold having a surface contour representing the desired contour of the laminated curvilinear article to be formed, sag-forming an inner shell mold of a first predetermined thickness on said master mold with a surface contour virtually identical to that of the master mold, sag-forming an outer shell mold of a second predetermined thickness on said master mold with a surface contour virtually identical to that of said master mold, positioning a first sheet of glass on said inner shell mold and sagging said sheet to conform to the surface contour of said inner shell mold, positioning a second sheet of glass on said outer shell mold and sag-forming said sheet to the surface contour of said outer shell mold, interposing laminating material between said sagged inner and outer layers, and laminating said layers together into a curvilinear composite laminate.

4,009,065
METHOD FOR SPLICING STRIP ENDS TOGETHER

Budai Mikulas, St. Gallen, Switzerland, assignor to Ferd. Ruesch AG, St. Gallen, Switzerland

Filed Oct. 10, 1974, Ser. No. 513,751
Claims priority, application Germany, Oct. 13, 1973, 2351533
Int. Cl.² B31F *5/06*
U.S. Cl. 156—159 **2 Claims**

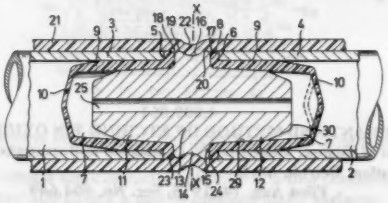


1. A method for splicing the ends of self-stick label composite strips each formed by a label strip comprising a series of labels and having a pressure-sensitive adhesive inner side, and a label carrier strip having an adhesive-repellent treated inner side on which the label strips's inner side is stuck for subsequent separation therefrom, said label and carrier strips having outer sides forming the outsides of the composite strip and providing adherence for pressure-sensitive adhesive, the composite strip ends being positioned to form an end-to-end joint and spliced by applying flexible pieces spanning said joint on both outsides of the composite strips and having pressure-sensitive adhesive surfaces stuck on said outsides of the composite strips by pressing the splicing pieces towards one another; wherein the improvement comprises first removing a length of said label strip from one of said composite strip ends so as to leave a length of said carrier strip extending therefrom with its said adhesive-repellent treated inner side exposed, and via the repellent treated inner side lapping said length of carrier strip on the adjacent outside of the carrier strip of the other of the composite strip ends while positioning the composite strip ends to form said joint and with said length of carrier strip spanning the joint, and then applying said flexible splicing pieces and pressing them towards each other, said length of carrier strip being interposed between the splicing pieces' pressure-sensitive adhesive surfaces in the event said joint is made with a space between said composite strip ends and the splicing pieces are by flexing pressed inwardly into said space.

4,009,066
METHOD OF MANUFACTURING TUBULAR ELEMENTS

Wilhelm Lachenmayer, Berlebeck, Germany, assignor to Benteler Werke AG, Bielefeld, Germany

Division of Ser. No. 225,878, Feb. 14, 1972, Pat. No. 3,776,993, which is a division of Ser. No. 865,283, Oct. 10, 1969, Pat. No. 3,661,184. This application July 27, 1973, Ser. No. 383,449
Claims priority, application Germany, Nov. 26, 1968, 1810957
The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.
Int. Cl.² B32B *31/00;* **B29C** *19/00*
U.S. Cl. 156—221 **6 Claims**



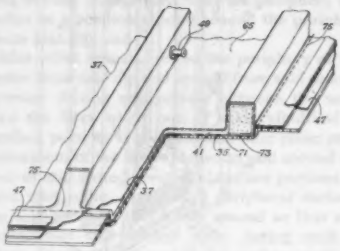
1. A method of manufacturing tubular elements comprising the steps of producing a pair of tubular members having opposite open ends and a radial end face surrounding each of said open ends; closing each of said open ends with discrete insert means, each including an annular portion overlying the respective radial end face; aligning said pair of tubular members and substantially juxtaposing said annular portions with spacing therebetween; surrounding both of the tubular members including the transition therebetween with insulating jacket means; and severing said jacket means intermediate said annular portions to thereby obtain two discrete tubular elements.

4,009,067

PROCESS OF FABRICATING COMPOSITE STRUCTURAL MEMBERS

Charles W. Rogers, 4029 Shadow Drive, Forth Worth, Tex. 76116

Filed July 7, 1975, Ser. No. 593,437
Int. Cl.² B29C 17/04
U.S. Cl. 156—245 5 Claims



1. The method of fabricating a structural member having two opposite sides of predetermined shapes, respectively, comprising the steps of:

obtaining two preformed sheets of thermoplastic material preformed to said predetermined shapes respectively,

said two preformed sheets being adapted to be assembled together with their inside surfaces facing each other,

said two preformed sheets being shaped such that the inside surfaces of their outer edges will abut against each other with a cavity formed between said two preformed sheets inward of their outer edges when said two preformed sheets are assembled together,

laying reinforcing material on the inside of at least one of said two preformed sheets in an area which defines the wall of said cavity,

said reinforcing material comprising thermosetting resin in the uncured state reinforced with fibers,

said thermosetting resin being of the type capable of bonding to said thermoplastic material,

said thermoplastic sheets of material having a thickness sufficient to maintain said predetermined shapes at atmospheric pressure during lay-up of the reinforcing material but thin enough to be moved inward to seat against the reinforcing material by a pressure differential created between the inside and outside of the cavity,

assembling said two preformed sheets together by abutting the inside surfaces of their outer edges with said reinforcing material located in said cavity between said two preformed sheets,

sealing together the outer edges of said two preformed sheets,

creating a gas pressure differential between the inside and outside of the cavity with a lower pressure maintained within the cavity relative to the pressure outside of the cavity to cause the walls of said two preformed sheets to seat against said reinforcing material, and

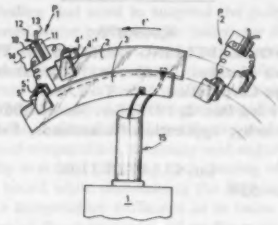
curing said resin at a temperature less than the softening temperature of said thermoplastic material to cause said resin and said fibers to bond together and to said preformed sheets such that said preformed sheets become an integral part of said structural member and define the outer surface thereof.

4,009,068

HIGH-FREQUENCY BONDING APPARATUS

Pierre Boussageon, Paris, France, assignor to Societe Generale pour l'Emballage, Paris, France

Continuation-in-part of Ser. No. 551,329, Feb. 20, 1975. This application Feb. 20, 1976, Ser. No. 659,955
Int. Cl.² B32B 19/02; H05B 9/04
U.S. Cl. 156—380 9 Claims



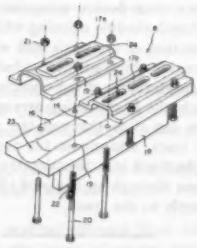
1. High-frequency bonding apparatus which comprises a rotating platform carrying a plurality of circumferentially spaced presses, each of said presses having electrode means for bonding material held thereby, stationary high frequency inductor means adjacent said rotating platform, a high frequency generator connected to said stationary inductor means, and a plurality of movable inductor means mounted on said platform, said movable inductor means being connected with the electrodes of said presses respectively and extending in position to overlap said stationary inductor means successively as said presses pass thereby and couple the inductor means of the presses with the stationary inductor means to supply high frequency energy to the electrodes of the presses successively for bonding the material held by the presses.

4,009,069

METHOD AND APPARATUS FOR PRODUCING SYNTHETIC RESIN TUBE

Mikio Kobayashi, Takatsuki, and Isamu Nakano, Toyonaka, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1975, Ser. No. 544,665
Claims priority, application Japan, Jan. 28, 1974, 49-12089; Apr. 16, 1974, 49-42871
Int. Cl.² B29D 23/10
U.S. Cl. 156—466 18 Claims



1. An apparatus for producing a synthetic resin tube comprising feed means for transporting a strip of synthetic resin having laterally disposed edges in a longitudinal direction, means for rendering at least one lateral edge of the strip adhesive during transport, and means defining a restricted space for passing the strip therethrough during transport so that the restricted space deforms the strip into a tubular shape having an axis extending in the longitudinal direction of the strip with the laterally disposed confronting edges of the strip being

brought into pressing contact with each other to conjoin the said edges, characterized in that the feed means comprises a pulling means for transporting the strip, the means defining the restricted space has a plurality of pressing members arranged along the periphery of the restricted space at least some of which are movable relative to each other diametrically of the said restricted space and wherein said movable members are urged in a direction toward a support member.

4,009,070

DEVICE FOR LABELLING OBJECTS ON TWO SIDES

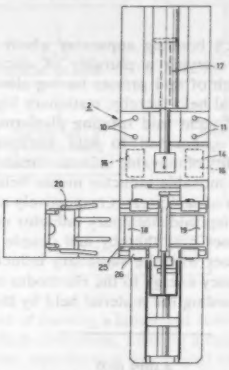
René Maurice Linmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1975, Ser. No. 637,069

Claims priority, application Netherlands, Feb. 12, 1974, 7415665

Int. Cl.² B32B *31/00*

U.S. Cl. 156—559 **2 Claims**



1. A device for labelling objects, such as tape cassettes, on two sides, the device being provided with two magazines for the relevant labels and means co-operating therewith for removing and transporting the labels to stations in the device adapted to receive the objects to be labelled, characterized in that the device comprises at least one feeding means for the objects to be labelled for feeding the objects to a track along which the objects can be transported to the stations, said track at the area of the stations comprising positioning means for the objects; a turn-over device arranged between these two stations, said turn-over device comprising a frame having a fully or partly closed window opening which is arranged transverse to the direction of the track and which opening has an inner circumference which at least substantially corresponds to the outer circumference of the objects in a direction transverse to the track, the frame being arranged in the track such that the objects can slide through the window when transported over the track, and means for moving the frame completely outside the track in a direction transverse to the tracks, rotating the frame through an angle of 180°, and returning the frame subsequently to the track.

4,009,071

SHEET BINDING APPARATUS

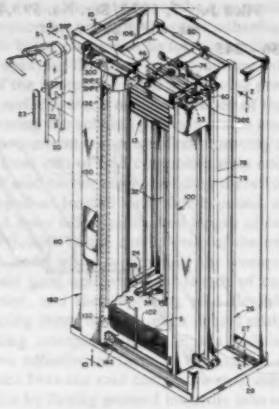
Donald L. Snellman; John C. Kuspert, both of Seattle, and Arthur G. Saunders, Maple Valley, all of Wash., assignors to Norfin, Inc., Seattle, Wash.

Filed Aug. 10, 1973, Ser. No. 387,541

Int. Cl.² B32B *31/00*; B05C *1/00*; B65H *39/02*

U.S. Cl. 156—563 **21 Claims**

1. Sheet binder apparatus, comprising in combination; compartment means for assembling sheets into individual groups with the sheets having at least one of their edges aligned in a single plane, adhesive binding means operatively associated with said compartment means and located adjacent said coplanar sheet edges for applying adhesive to bind the sheets in at least one of said groups at a location along the length of the



coplanar edges thereof, and hold down means operatively associated with said binding means and said compartment means for holding the sheets of said one group stationary to maintain coplanar edge alignment thereof during binding.

4,009,072

STRIP APPLYING DEVICE

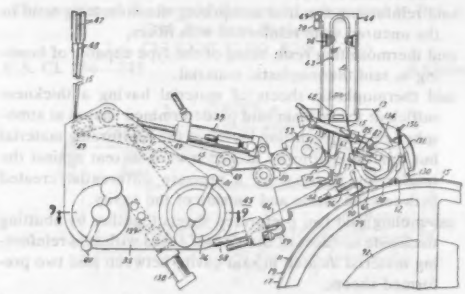
Thomas E. Schultz, Roseville, and Peter W. Schuchardt, May Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 451,684, March 15, 1974, Pat. No. 3,899,383. This application Aug. 11, 1975, Ser. No. 603,790

The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.

Int. Cl.² B29H *21/02*

U.S. Cl. 156—584 **2 Claims**



1. A mechanism adapted to drive a length of strip material from a supply length of strip material having a protective liner applied thereto while stripping the liner from the strip material, said mechanism comprising:

a first roller having a cylindrical peripheral surface about an axis;

a second roller having cylindrical peripheral surface portions about an axis and at least two flatted peripheral surface portions, said first and second rollers being spaced in an axially parallel relationship to provide a nip therebetween adapted to afford driving engagement on opposite surfaces of said lined strip material extending

through the nip therebetween when one of said cylindrical peripheral surface portions is at said nip, and said flatted peripheral surface portions affording movement of the lined strip material through the nip relative to the periphery of the rollers when one of said flatted peripheral surface portions is at said nip;

means for individually driving said first roller and said second roller in opposite rotational directions to propel said lined strip material through said nip when one of said cylindrical peripheral surface portions is at said nip;

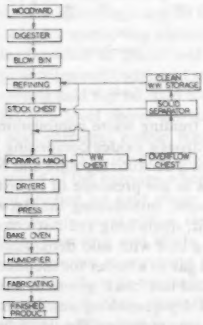
means for pressing the separated strip material into continuous driving engagement with the periphery of said first roller at a position spaced around the periphery thereof from said nip; and

an idler roller spaced around the periphery of said second roller from said nip and spaced from said second roller to provide driving engagement between the second roller and the liner when one of said cylindrical peripheral surface portions is adjacent said idler roller and to afford movement of the liner relative to said second roller when one of said flatted peripheral surface portions is opposite said idler roller, said flatted peripheral surface portions on said second roller being spaced so that at an adjust position of said second roller during each revolution thereof, one flatted peripheral surface portion is at the nip between said first and second rollers, while the other flatted peripheral surface portion is opposite said idler roller so that the mechanism will provide positive separation of the liner from the strip material when the lined strip material is driven through the nip between the driven first and second rollers with the strip material then extending along the periphery of the first roller to said means for pressing and the liner extending along the periphery of the second roller to the idler roller, and any slack accumulated in the strip material and liner on the peripheries of the first and second rollers will be removed by slippage caused from tension in the supply length of lined strip material when said second roller rotates through said adjust position.

4,009,073
PRODUCTION OF HARDBOARD IN A CLOSED WATER SYSTEM

James A. Pozzo, Troy, Mich., and Maxwell M. Yan, Oakville, Canada, assignors to Abitibi Paper Company Ltd., Toronto, Canada

Filed Aug. 11, 1975, Ser. No. 603,686
Int. Cl.² D21F *11/04, 13/00*
U.S. Cl. 162—132 **11 Claims**



1. A process of manufacturing hardboard including the steps of: preparing a pulp stock comprising a suspension of lignocellulose fibres in water, said water also containing therein dissolved solubles which consist essentially of wood sugars released primarily during the pulp stock preparation, mechanically dewatering said pulp to form a wet mat, drying the wet mat by thermal evaporation, and subsequently pressing the dry mat between the forming surfaces of a heated press to form a hardboard, the improvement comprising: retaining the solubles released during said pulp stock preparation in the water in which said fibres are suspended collecting said solubles-containing water which is separated from said pulp during said mechanical dewatering thereof and feeding said solubles-containing water back to join the water which is used in the process, including that used to suspend the pulp, thereby to provide a closed water process with said water thereby being enriched principally by the dissolved wood sugars therein such that said wood sugars are present in the pulp stock in an amount of from about 2.5 to about 10% by weight, a substantial portion of the dissolved wood sugars in said wet mat being deposited on the surfaces of said mat during said drying of the mat by thermal evaporation, retaining said sugars on the surface of the dry mat, and effecting said pressing of the dry mat to form said board while maintaining the forming surfaces of the press at a temperature sufficient as to cause flowing and caramelization of the sugars retained on the major surfaces of the board immediately adjacent to or in contact with the press forming surfaces to thus provide a skin or crust of said sugars at said major surfaces of the board.

4,009,074
PREPARATION OF LEVULOSE FROM GRANULAR STARCH

Raoul Guillaume Philippe Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 13, 1975, Ser. No. 558,184
Int. Cl.² C12B *13/02*
U.S. Cl. 195—31 F **12 Claims**

1. A process for the direct conversion of granular starch to levulose comprising forming an aqueous slurry of granular starch, bacterial alpha-amylase, glucoamylase and glucose isomerase derived from *Streptomyces albus*, at a temperature of at least about 40° C and below the temperature at which the starch is gelatinized, at a pH of from about 5 to about 7 and maintaining the conditions of temperature and pH so that the insoluble starch retains its essentially granular form while a soluble starch hydrolysate containing levulose is produced, whereby any residual insoluble starch remains in essentially granular, ungelatinized form.

4,009,075
PROCESS FOR MAKING ALCOHOL FROM CELLULOSIC MATERIAL USING PLURAL FERMENTS

William H. Hoge, Flemington, N.J., assignor to Bio-Industries, Inc., Hialeah, Fla.

Filed Aug. 22, 1975, Ser. No. 606,789
Int. Cl.² C12C *11/14*
U.S. Cl. 195—33 **9 Claims**

1. A process for making ethanol from cellulosic fibrous material comprising the steps of steam sterilization of the cellulosic material, thereafter subjecting the resultant sterilized cellulosic material to digestion and fermentation reaction with an innoculum mixture comprising cellulase enzyme and a yeast whereby the cellulosic material is converted to simple sugars with conversion of said sugars to ethanol and recovering ethanol from said digestion and fermentation reaction by vacuum stripping, and recycling the innoculum enzyme-containing residual liquid for reuse to digest subsequent charges of cellulosic material, said digestion of the cellulosic material to simple sugars and the fermentation reaction of the sugars to ethanol being carried out concurrently.

4,009,076

ENZYME GRANULES

Robin John Green; Michael David Key, both of Wirral, England, and Keith William Murray, Mold, Wales, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 2, 1973, Ser. No. 412,394

Claims priority, application United Kingdom, Nov. 3, 1972, 50681/72

Int. Cl.² C07G 7/02

U.S. Cl. 195—63 11 Claims

1. An enzyme granule comprising a granule core of solid material carrying an enzyme, said granule having around it a continuous, non-tacky solid coating of plasticised resin substantially free of the enzyme, the resin being selected from the group consisting of dextrin and alkali metal liguosulphonate and having at 20° C and at a neutral pH, a solubility in water of at least 50% by weight, and a 50% aqueous solution of the resin at 20° C having a viscosity of from 0.1 to 25 poises.

4,009,077

PROCESS FOR THE PREPARATION OF PHENOPICOLINIC ACID

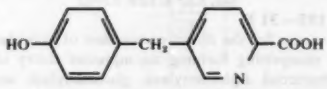
Osamu Tanabe; Akira Obayashi, both of Uji; Teruya Nakamura, Muko; Osamu Suzuka, Kyoto; Masao Murayama, Kyoto, and Shingo Matsumura, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Continuation-in-part of Ser. No. 582,766, June 2, 1975, abandoned. This application Aug. 22, 1975, Ser. No. 607,039

Int. Cl.² C12D 13/02

U.S. Cl. 195—81 2 Claims

1. Process for preparation of phenopicolinic acid of the formula:



which comprises culturing a phenopicolinic acid producing strain of the genus Paecilomyces, under aerobic conditions in a medium containing one or more assimilable sources of carbon and one or more assimilable sources of nitrogen, and isolating the phenopicolinic acid thus formed from the culture broth.

4,009,078

DETECTING THE PRESENCE OF MICROORGANISMS

Judd R. Wilkins, Hampton, and Glenn E. Stoner, Charlottesville, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C. and The University of Virginia, Charlottesville, Va.

Continuation-in-part of Ser. No. 543,860, Jan. 24, 1975, abandoned. This application Dec. 16, 1975, Ser. No. 641,279

Int. Cl.² C12K 1/04

U.S. Cl. 195—103.5 R 15 Claims

1. A method for detecting the presence of a microorganism in a fluid sample, which comprises:

culturing a microorganism in a liquid growth medium which is in contact with a measuring electrode and a reference electrode; and

detecting the changing potential between said electrodes, which arises by the migration and accumulation of said microorganism adjacent the surface of said measuring electrode thus forming a charge-charge interaction between said measuring electrode and accumulated microorganisms, by measuring said potential change with a high impedance potentiometer having an input impedance of 10^7 to 10^{10} ohms.

4,009,079

METHOD FOR QUANTITATIVELY DETERMINING GLUCOAMYLASE IN HUMAN URINE AND BODY FLUIDS

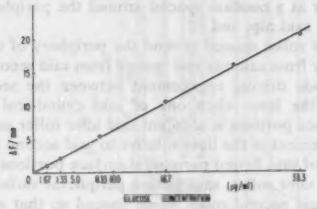
Kazuaki Tsujino; Junnosuke Kida, both of Osaka; Masanobu Hosotani, Takatsuki; Noshi Minamiura, Nara, and Takehiko Yamamoto, Izumi, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 26, 1976, Ser. No. 652,012

Claims priority, application Japan, Jan. 24, 1975, 50-10731

Int. Cl.² G01H 31/14

U.S. Cl. 195—103.5 R 1 Claim



1. A method for determining the amount of glucoamylase in human urine and body fluids which comprises removing low molecular weight substances having a molecular weight of from about 500 to about 20,000 from a human urine or body fluid sample, adding to the resulting sample which is free of low molecular weight substances maltotriitol which is a specific substrate of glucoamylase, and measuring the amount of glucose, which is the degradation product of the substrate.

4,009,080

METHOD OF TREATING WASTE COMBUSTION GAS FROM COKE OVEN

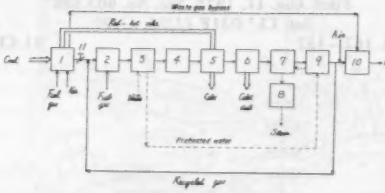
Masaharu Kurokawa, Sakai, and Mitsuru Torii, Itami, both of Japan, assignors to Osaka Gas Company, Ltd., Osaka, Japan

Filed Oct. 14, 1975, Ser. No. 622,240

Claims priority, application Japan, Oct. 16, 1974, 49-119617

Int. Cl.² C10B 39/02

U.S. Cl. 201—29 3 Claims

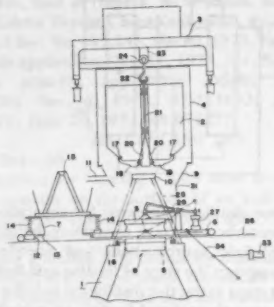


1. A method of treating waste combustion gas from a coke oven containing nitrogen oxides comprising the steps of passing the waste gas to a deoxidizing zone and burning said waste gas with a fuel gas in the presence of an oxidizing catalyst in said deoxidizing zone, introducing the deoxidized gas into a dry-quenching unit, quenching red-hot coke introduced into said dry-quenching unit with said deoxidized gas passing said heated deoxidized gas to a boiler for the recovery of the sensible heat of the red-hot coke given to the deoxidizing gas egressing from the dry-quenching unit for use as a heat source for generating steam, recycling the deoxidized gas from said boiler to said deoxidizing zone for use as a gas for quenching the red-hot coke, said oxidizing catalyst being at least one species selected from the group consisting of platinum, ruthenium, palladium, oxides of vanadium, cobalt, copper nickel, manganese, chronium and silver.

4,009,081
DUST ARRESTING APPARATUS FOR A COKE DRY QUENCHING STATION

Takeshi Ueda; Kunihei Koizumi, both of Yokohama; Tatsu Otani, Yokosuka, and Shun-ichi Hironaka, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1975, Ser. No. 634,324
Claims priority, application Japan, Nov. 27, 1974, 49-135598
Int. Cl.² C10B 31/02
U.S. Cl. 202—227 3 Claims

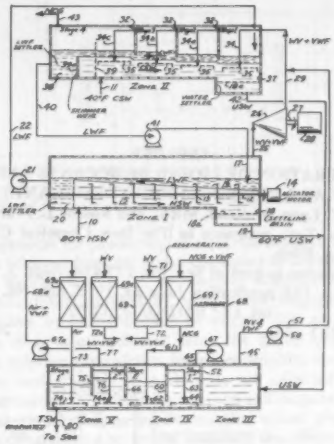


1. In a coke dry quenching installation including a traveling crane for moving a coke bucket which is loaded with hot coke from a coke oven to a position above the top of a dry quenching station, the provision of a dust arresting apparatus comprising: a first hood permanently mounted on said traveling crane to enclose an upper surface and an outer side wall of said coke bucket when said coke bucket is suspended from said traveling crane; rest means fixedly mounted above a coke charging hole provided at the top of said dry quenching station for holding said coke bucket suspended from said traveling crane to charge the hot coke in said bucket into said quenching station; a second hood fixedly mounted together with said rest means to enclose said rest means and adapted to form a unitary hood together with said first hood when said coke bucket is positioned in place on said rest means by said traveling crane, the lower edge portion of said first hood being then positioned close to the upper edge portion of said second hood; a duct connected to said second hood for connecting the interior of said second hood to a suction port of a dust collecting means; a traveling carriage mounted above said coke charging hole and including a top lid for closing the coke charging hole of said dry quenching station, and a chute, said carriage being displaceable to place said chute above said coke charging hole in alignment with said second hood, means for opening and closing said top lid, said top lid being raisable in its open position to a level above the top of the station to permit travel of said carriage; elastic means for urging the lower end of said chute to a position above the top of the station to permit travel of the carriage when the weight of said coke bucket is not applied on said chute; a flange having a downwardly extended peripheral wall at the lower end of said chute; and means for lowering said chute in response to the weight of said coke bucket comprising a pair of saddles mounted on said movable chute to normally occupy a position above said rest means such that when the coke bucket is lowered it rests on said saddles and lowers said chute against the action of the elastic means, an annular groove being provided in said top around said coke charging hole and containing water, said annular groove being positioned to receive said peripheral wall of said flange to provide a water seal when said chute is lowered.

4,009,082
PRODUCTION OF ENERGY BY DIRECT CONTACT OF WATER IMMISCIBLE WORKING FLUID WITH HOT OR WARM WATER TO VAPORIZE LIQUID WORKING FLUID, UTILIZATION OF VAPOR TO PRODUCE MECHANICAL ENERGY AND DIRECT CONTACT OF SPENT VAPOR WITH COLD OR COOL WATER TO CONDENSE SAME

Calvin Schwartz Smith, Jr., 8529 Betty Lane, El Cerrito, Calif. 94530

Continuation-in-part of Ser. Nos. 480,963, June 19, 1974, and Ser. No. 224,018, Feb. 7, 1972, Pat. No. 3,856,631, and Ser. No. 19,592, March 16, 1970, Pat. No. 3,640,850. This application Dec. 1, 1975, Ser. No. 636,417
Int. Cl.² B01D 3/00, 3/34
U.S. Cl. 203—11 25 Claims



1. A method of deriving mechanical energy from a source of relatively hot or warm water (HW) and a source of relatively cold or cool water (CW) wherein a working fluid (WF) is vaporized from the liquid state (LWF) to the vapor state (VWF) by heat from the hot or warm water source (HW), the vapor (VWF) is expanded through a combustionless gas pressure to mechanical energy converter, the expanded vapor (VWF) of working fluid (WF) is condensed by the source of cold or cool water (CW) and the condensate (LWF) is recycled, said working fluid (WF) being immiscible with water, being more volatile than water, and having a density different from that of water to allow its separation from water by gravity, such method comprising:

a. providing a first zone (LWF heating Zone I) having a warm water inlet and a relatively cool water outlet, such zone being adapted to cause intimate direct contact of liquid working fluid (LWF) with water (HW) to vaporize said liquid working fluid at least in part,

b. providing a second zone (VWF condensing zone II), having a cold water inlet and a relatively warmer water outlet, such zone being adapted to cause intimate direct contact of both vapor of working fluid (VWF) and condensate thereof (LWF) with water (CW),

c. causing flow of relatively hot or warm water (HW) through Zone I from its water inlet to its water outlet,

d. causing flow of relatively cold or cool water (CW) through Zone II from its water inlet to its water outlet,

e. providing said working fluid (WF) in the form of a mixture of two or more molecular species and having a boiling range,

f. causing such working fluid in liquid state (LWF) arriving from Zone II to pass through Zone I countercurrently to the flow of water (HW) and in intimate direct contact with the water to vaporize the liquid working fluid,

g. causing the vapor of working fluid (VWF) generated in step (f) to expand through a combustionless gas pressure to mechanical energy converter thereby producing mechanical energy,

h. causing the expanded vapor (VWF) from step (g) to pass into Zone II and to flow, together with its condensate (LWF), through Zone II countercurrently to the flow of water (CW) therein and in intimate direct contact with said water, thereby condensing the vapor of working fluid (VWF) to liquid working fluid (LWF), and

i. separating the liquid working fluid (LWF) produced in step (h) and returning it to Zone I.

4,009,083

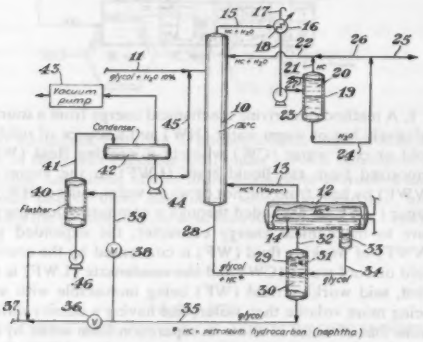
REGENERATION OF LIQUID DESICCANTS AND ACID GAS ABSORBING LIQUID DESICCANTS

George W. Lyon, Midland, Mich., and Roscoe L. Pearce, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 177,414, Sept. 2, 1971, abandoned. This application June 23, 1975, Ser. No. 589,225

Int. Cl.² B01D *3/34, 53/02*

U.S. Cl. 203—49 **25 Claims**



* HC = petroleum hydrocarbon (naphtha)

1. In a method of regenerating liquid desiccants or acid gas absorbing liquid desiccants or mixtures thereof, the steps comprising, feeding a rich liquid absorbent into an upper portion of a regeneration column, vaporizing by heat a normally liquid hydrocarbon or mixture of hydrocarbons substantially insoluble in the dried desiccant and in water, which hydrocarbon has a boiling temperature below the upper and above the lower critical solution temperatures of the mixture of the desiccant and the said hydrocarbon under the pressure conditions employed, passing the vapors upwardly through the rich liquid absorbent, said vapors being the sole source of heat added for regeneration of the desiccant, condensing overhead vapors from the regenerator out of direct contact with the rich liquid absorbent, separating liquid hydrocarbon from water, and returning at least a portion of the overhead hydrocarbon condensate to the regeneration column as reflux, passing a two phase liquid mixture from the regenerator into a separator to form a lean desiccant phase and a liquid hydrocarbon phase, passing the hydrocarbon phase into a vaporizer wherein the hydrocarbon phase is heated and vaporized for recycle to the regenerator, and removing the lean desiccant phase from the separator.

4,009,084

PROCESS FOR THE SEPARATION OF DIOLEFINS FROM MIXTURES CONTAINING THE SAME

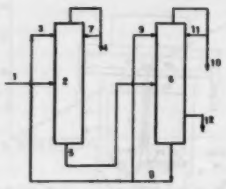
Giancarlo Paret, Milan, and Ermanno Cinelli, San Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 305,549, Nov. 10, 1972, abandoned, which is a continuation of Ser. No. 55,660, July 17, 1970, abandoned. This application Jan. 15, 1975, Ser. No. 541,343

Claims priority, application Italy, July 18, 1969, 19814/69

Int. Cl.² B01D *3/34*

U.S. Cl. 203—53 **1 Claim**



1. An extractive distillation process for separating butadiene from a hydrocarbon mixture containing butadiene, C-4 saturated and olefinic hydrocarbons and acetylenic compounds which comprises the steps of feeding said hydrocarbon mixture to a first stage extractive distillation column at a point spaced below the top thereof and feeding an extractive distillation agent consisting of an aqueous mixture of N-formyl morpholine and up to 20% of water to said first stage extractive distillation column at the top thereof, withdrawing said C-4 saturated and olefinic hydrocarbons from the top of the first stage extractive distillation column, withdrawing the butadiene, the extractive distillation agent and the acetylenic compounds as a bottom product from said first stage extractive distillation column, thereafter feeding said bottom product to a second stage extractive distillation column at a point spaced below the top thereof, recovering butadiene from said second stage extractive distillation column as overhead, recovering the acetylenic compounds and the extractive distillation agent from the bottom of the second stage extractive distillation column, dividing the extractive distillation agent recovered from the bottom of the second stage extractive distillation column into two portions, recycling one of said portions to the first stage extractive distillation column to the top thereof, and recycling the other of said portions to said second stage extractive distillation column to the top thereof.

4,009,085

LUBRICATING COATING FOR METAL SHEET

Richard E. Woehrle, Berkley, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation of Ser. No. 545,986, Jan. 31, 1975, abandoned, which is a division of Ser. No. 320,642, Jan. 2, 1973, Pat. No. 3,922,183, which is a continuation-in-part of Ser. No. 158,511, June 30, 1971, abandoned. This application Dec. 18, 1975, Ser. No. 642,065

Int. Cl.² C25D *9/08*

U.S. Cl. 204—27 **7 Claims**

1. A process for treating metal sheet and strip stock to impart lubricity and abrasion resistance thereto which comprises electrodepositing a lubricating film containing both trivalent chromium oxide and a water soluble surfactant from an aqueous bath composition and containing hexavalent chromic acid in a concentration of from 1 gram per liter to 100 grams per liter and at least one water soluble surfactant in a concentration of 0.05 grams per liter to 20 grams per liter which comprises passing current from an anode to a cathode through said aqueous bath composition, at a current of 1–30 amperes per square decimeter (asd) and a temperature of 40°–85° C, for a time period of from 0.5 to 5 seconds to de-

posit a lubricant containing trivalent chromium oxide film containing 0.1 milligrams to 100 milligrams of occluded surfactant and 3 milligrams to 300 milligrams of trivalent chromium oxide per square meter of treated surface upon said cathode.

4,009,086

METHOD FOR A SURFACE TREATMENT OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoake; Tohru Arai, and Yoshihiko Sugimoto, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Division of Ser. No. 412,246, Nov. 2, 1973, Pat. No. 3,930,575. This application Oct. 17, 1975, Ser. No. 623,330

Claims priority, application Japan, Nov. 6, 1972, 47-111030; Nov. 6, 1972, 47-111033; June 26, 1973, 48-071276; June 26, 1973, 48-071277

Int. Cl.² C25D *3/66*

U.S. Cl. 204—39 **12 Claims**

1. A method for forming a hard layer comprising the carbide of titanium on the surface of an iron or ferrous alloy article containing at least 0.05% by weight of carbon, comprising the steps of

preparing a molten bath consisting essentially of 60 to 99% by weight of a molten boron compound selected from the group consisting of boric acid and borate and 1 to 40% by weight of a substance containing titanium in a vessel,

immersing the article into the molten bath at a temperature within the range of from 800° to 1100° C,

applying an electric current with a current density of cathode within a range of 0.005 to 5 A/cm² to the molten bath through said article being used as the cathode and a carbon anode being contacted with the molten bath for forming the hard layer comprising the carbide of titanium on the surface of said article, and

taking said article out of said molten bath.

4,009,087

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 525,718, Nov. 21, 1974, Pat. No. 3,956,079, and a continuation-in-part of Ser. No. 525,940, Nov. 21, 1974, Pat. No. 3,940,320, which is a continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Dec. 24, 1975, Ser. No. 644,350

Int. Cl.² C25D *3/38*

U.S. Cl. 204—52 R **84 Claims**

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 to 40 grams per liter of an N-heteroaromatic compound containing 1 or 2 N-heteroaromatic rings, said rings being selected from a group consisting of pyridine, quinoline, isoquinoline and the benzoquinolines, which compound does not contain nonquaternary amino groups that are not part of the said N-heteroaromatic rings, nor bivalent sulfur atoms, and is not quaternized on its ring nitrogen atoms by aralkyl, aryl, alkaryl radicals; and

B. about 0.01 mg/l to 1000 m/l of sulfoalkylsulfide and sulfoarylsulfide compounds containing the grouping —S-$_n$—X—SO_3M where n = 1 to 5, —X— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms or a divalent aromatic or aliphatic-aromatic hydrocarbon group of 6 to 12 carbon atoms and M is one gram-equivalent of a cation.

4,009,088

PROCESS FOR PRODUCING AQUEOUS SOLUTIONS OF SODIUM, AMMONIUM AND MAGNESIUM SULPHITE

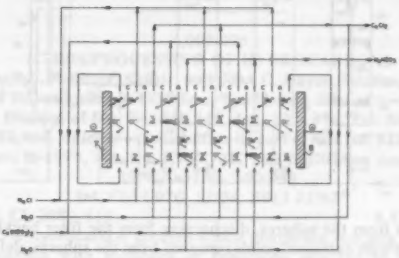
Hans Joachim Hampel, Eschborn; Rolf Eggersdorfer, Bad Homburg, both of Germany, and Alpo Johannes Ora, Rauma, Finland, assignors to Rauma-Repola Oy, Rauma, Finland

Continuation of Ser. No. 665,851, March 10, 1976, abandoned. This application Apr. 7, 1976, Ser. No. 674,554

Claims priority, application Germany, Mar. 10, 1975, 2510343

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 P **10 Claims**



1. A process for producing an aqueous solution of a solute product selected from the group consisting of sodium sulphite, sodium hydrogen sulphite, ammonium sulphite, ammonium hydrogen sulphite, magnesium sulphite and magnesium hydrogen sulphite by electrodialysis between a first aqueous feed solution of a solute selected from the group consisting of calcium sulphite and calcium hydrogen sulphite and a second aqueous feed solution of a chloride salt selected from the group consisting of sodium, ammonium and magnesium chloride, said electrodialysis producing the solute product and calcium chloride as a by-product wherein the electrodialysis is performed in a multi-cell stack electrodialysis unit having an anode and a cathode electrode and alternately arranged anion and cation selective membranes between the cells thereof, which comprises flowing the first aqueous feed solution through a first cell having a cation selective membrane separating it from the cell on one side and an anion selective membrane separating it from the cell on the other side; flowing a dilute aqueous solution of the by-product through the cell adjacent the cation selective membrane side of the first cell and a dilute aqueous solution of the solute product through the cell adjacent the anion selective membrane side of the first cell and passing the second aqueous feed solution of the chloride salt through cells on each of the other sides of the product and by-product cells, the second feed solution cell being separated from the by-product cell by an anion selective membrane and from the product cell by a cation selective membrane whereby when d.c. voltage of adequate polarization is applied to the electrodes of said multi-cell stack, the ions of said first and second aqueous feed solutions pass through the separating membranes to produce the product solute in the product cell and calcium chloride in the by-product cell.

4,009,089

FILTERING PROCESS

James H. Crissman, Kiskiminetas Township, and G. Ray Fritsche, Bradford Woods, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

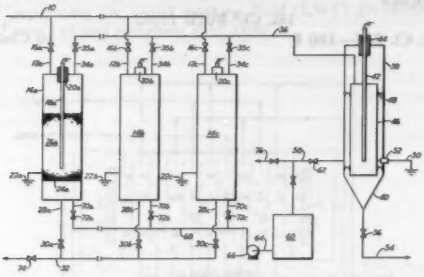
Filed Sept. 15, 1975, Ser. No. 613,257

Int. Cl.² B03C *5/00*

U.S. Cl. 204—188 **11 Claims**

1. A method of separating finely divided solid particles having a nominal diameter less than 5 microns from a nonconductive liquid comprising maintaining a voltage gradient of

5–20 kilovolts per inch in a permeable bed of smooth ceramic spheres having a diameter of one-eighth inch to one-fourth inch supported within a filter casing, passing the nonconductive liquid through the permeable bed whereby solid particles in the liquid are deposited on the ceramic spheres, discharging filtered product from the filter, decharging the filter by discontinuing the voltage gradient through the filter bed when the amount of solids deposited increases above a desired range, flowing a backflush liquid upwardly through the decharged permeable bed at a rate adapted to remove deposited



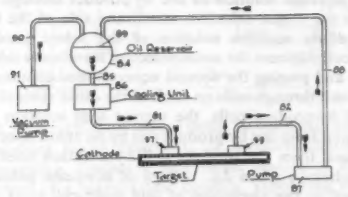
solids from the spheres, discharging from the filter backflush liquid with entrained solids removed from the spheres, delivering the backflush liquid and entrained solids into an electrothickener containing spaced-apart electrodes with unobstructed space between the electrodes, applying a voltage gradient of 10–30 kilovolts per inch to the backflush liquid in the electrothickener, holding the backflush liquid in the electrothickener to allow settling of solid particles from the backflush liquid in the electrothickener, withdrawing settled solids from the bottom of the electrothickener, and separately withdrawing backflush liquid from the electrothickener.

4,009,090

SPUTTER-COATING OF GLASS SHEETS OR OTHER SUBSTRATES

Neil D. Veigel, Novi, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Dec. 3, 1975, Ser. No. 637,281
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 **11 Claims**



1. In the method of sputter-coating glass sheets and other substrates with a thin film of a selected coating material applied by transport from a surface of a sputtering cathode provided with a chamber through which a cooling medium is circulated, the improvement which comprises circulating an oil under a constant head pressure through a closed system in which the cathode is interposed, and continuously withdrawing air and other gases from said system to reduce the pressure differential across the walls of the cathode as the oil circulates through the cathode chamber at less than atmospheric pressure.

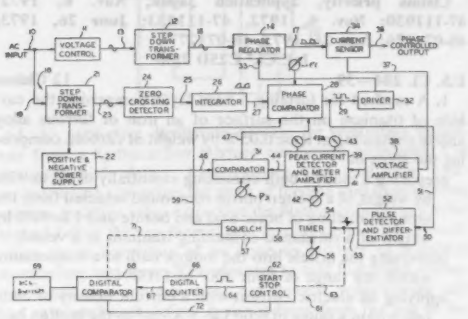
6. In apparatus for sputter-coating glass sheets and other substrates with a thin film of a selected coating material, a cathode which includes a housing having a chamber therein, said housing adapted to have a sheet of the coating material applied to a surface thereof, means for internally cooling said cathode comprising a closed cooling system in which the cathode is interposed, said system including means for circulating an oil under constant heat pressure through the chamber in said cathode, and means for continuously withdrawing air and other gases from said system such that the pressure differential across the walls of the cathode chamber is less than atmospheric pressure.

4,009,091

SKIPPING SINE WAVE PULSE PLATER SYSTEM

Harold Washington, Countryside, and Martin Kozi, Berwyn, both of Ill., assignors to Instrumentation & Control Systems, Inc., Addison, Ill.

Filed Apr. 27, 1976, Ser. No. 680,727
Int. Cl.² C25B *15/02*; C25D *21/12*
U.S. Cl. 204—228 **10 Claims**



1. A skipping sine wave pulse plating system for providing power from an alternating current source to electrodes in an electro-plating bath,

said system comprising voltage control means for controlling the amplitude of the power provided to said electrodes,

duty cycle control means for controlling the duty cycle of the power applied to said electrodes by conducting only during prescribed phases of said alternating current,

means for connecting said duty cycle control means to said electrodes,

power sensing means in said connecting means for determining the power provided to said electrodes,

drive circuit means for controlling said duty cycle control means,

phase comparator means associated with said drive circuit means for setting said duty cycle by controlling the prescribed phases,

drive circuit control means operated responsive to said power sensing means for controlling said drive circuit means to maintain the duty cycle as set, and

squelching means for controlling the output of said drive circuit means to enable reducing the duty cycle to a condition of less than 25 percent while still maintaining a constant output amplitude.

4,009,092

SUBSTITUTED LITHIUM PHOSPHATES AND SOLID ELECTROLYTES THEREFROM

Barry Edward Taylor, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1976, Ser. No. 662,003
Int. Cl.² C25B *9/00*; H01M *6/04*
U.S. Cl. 204—242 **16 Claims**

1. A lithium phosphate of the formula:

$$Li_{1-2z-4x}Mg_xM_{3-y}^{4+}M_y^{3+}(P_{1-2x}Si_{2x})_3O_4)_3 \cdot q(Li_2O)$$

wherein

M^{4+} is at least one of zirconium and hafnium;

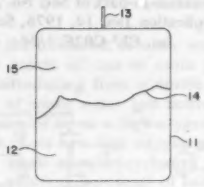
M^{5+} is at least one of niobium and tantalum;
x is 0 to about 0.15;
y is 0 to about 0.5;
z is 0 to about 0.3;
q is 0 to about 0.2; and
$2x+y-z$ is at least -0.1 and at least one of x, y and z is not equal to 0.

4,009,093

PLATABLE POLYMERIC COMPOSITION

Daniel Luch, Warwick, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 408,410, Oct. 23, 1973, Pat. No. 3,865,699. This application Nov. 27, 1974, Ser. No. 527,532
Int. Cl.² C25B *11/04*
U.S. Cl. 204—291 **2 Claims**



1. A cathode adapted to be employed in a process of electrodeposition wherein metal of Group VIII of the periodic table is electrodeposited directly thereon comprising a structure formed from a composition comprising a polymer from the group of polyethylene, polypropylene and mixtures and copolymers thereof and, in percent by weight of the total composition, about 15% to about 60% of carbon black and a material from the group of sulfur and sulfur donors in an amount equivalent in sulfur content to about 1% to about 10% of dipentamethylenethiuram hexasulfide, said carbon black being in an amount sufficient to provide in said composition of matter in massive form an electrical volume resistivity of less than about 1000 ohm-centimeters, the sulfur and carbon black being present in said composition of matter in cooperative amounts sufficient to induce rapid coverage of said composition of matter with Group VIII metal when said cathode is employed in a Group VIII metal electrodeposition bath.

4,009,094

STABILIZING PYROLYSIS NAPHTHA

Edward L. Cole, Fishkill, and John T. Nolan, Jr., Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,759
Int. Cl.² C10G *9/14, 35/02*
U.S. Cl. 208—48 AA **8 Claims**

1. A process for reducing reactive olefinic and diolefinic unsaturation of pyrolysis naphtha, which process comprises:

a. mixing pyrolysis naphtha with water in a liquid volume ratio of from about 0.5/1 to about 3/1 pyrolysis naphtha to water;

b. mixing the pyrolysis naphtha-water mixture of step (a) with residuum oil to form a pyrolysis naphtha-water-residuum oil mixture comprising not more than about 10 liquid volume percent pyrolysis naphtha-water mixture;

c. treating the pyrolysis naphtha-water-residuum oil mixture of step (b) at conditions for delayed coking of said residuum oil; and

d. recovering a naphtha product fraction, substantially free of reactive olefinic and diolefinic unsaturation from treating step (d).

4,009,095

MIXED-PHASE FLUID DISTRIBUTION FOR PACKED CHAMBERS

Don B. Carson, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 414,555, Nov. 9, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,285
Int. Cl.² B01J *13/00;* **C10G** *13/00*
U.S. Cl. 208—108 **10 Claims**

1. In the catalytic treatment of hydrocarbons wherein a mixture of hydrocarbon liquid and a gas is passed through a bed of solid particulate catalyst at conversion conditions, the improvement which comprises generating foam from said mixture and introducing said foam to the bed of solid catalyst.

4,009,096

HYDROPROCESSING OF HYDROCARBONS

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 648,544, Jan. 12, 1976, Pat. No. 3,992,464, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application June 4, 1976, Ser. No. 693,059
Int. Cl.² C07G *13/04;* **B01J** *23/62*
U.S. Cl. 208—111 **6 Claims**

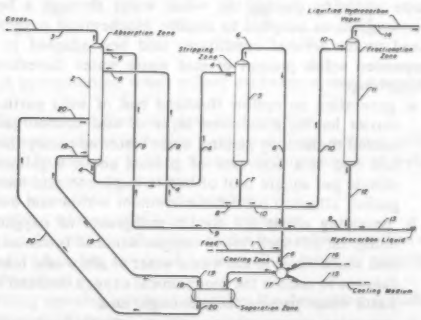
1. A hydrocarbon process which comprises reacting a hydrocarbon with hydrogen at conditions selected to effect chemical consumption of hydrogen, and in contact with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt.% platinum group metal, about 0.5 to about 5 wt.% cobalt, about 0.01 to about 5 wt.% tin and about 0.1 to about 3.5 wt.% halogen, wherein the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the tin is present in an oxidation state above that of the elemental metal, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions.

4,009,097

SEPARATION PROCESS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 453,656, March 21, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,888
Int. Cl.² C10G *5/04*
U.S. Cl. 208—342 **3 Claims**



1. A process for the recovery of selected hydrocarbon liquid and vapor constituents from a feed stream containing said constituents, which comprises the steps of:

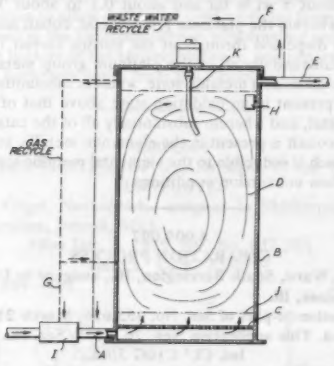
a. commingling said feed stream with a stripped vapor formed as hereinafter set forth;

b. cooling the resultant mixture sufficiently to effect partial condensation thereof;
c. separating the thus cooled mixture into a liquid phase and a vapor phase;
d. introducing said vapor phase into the lower portion of an absorption zone and introducing said liquid phase to said zone at a higher elevation than the vapor phase;
e. passing a rich oil from the lowermost point of the absorption zone to a stripping zone and therein stripping absorbed components therefrom;
f. commingling resultant stripped components with said feed stream as said stripped vapor;
g. introducing a portion of the stripped oil from the stripping zone to the absorption zone at higher elevation than said liquid phase;
h. fractionating another portion of the stripped oil from the stripping zone to separate hydrocarbon vapors therefrom; and
i. supplying at least a portion of the resultant fractionation bottoms to said absorption zone at a higher elevation than the first-mentioned portion of said stripped oil from the stripping zone.

4,009,098
WASTE TREATMENT PROCESS

John S. Jeris, Yonkers, N.Y., assignor to Ecolotrol, Inc., Bethpage, N.Y.

Filed Feb. 16, 1973, Ser. No. 333,394
Int. Cl.² C02C 1/04
U.S. Cl. 210—3 8 Claims

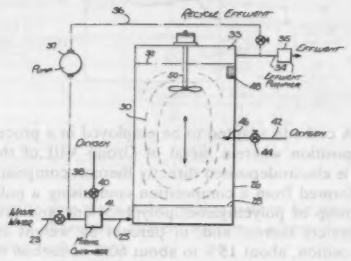


1. Process for removing biochemical oxygen demand from waste water by passing the waste water through a bed of microorganisms adapted to oxidize biochemical oxygen demand under aerobic conditions, said bed adapted to pass suspended solids present in said waste water therethrough, comprising:
a. generating an upflow fluidized bed of solid particulate carrier having a cultured layer of said microorganisms seeded thereon by passing waste water upwardly through said bed at a flow rate of at least about 6 gallons per minute per square foot of bed to impart to said microorganism attached particles movement within said bed;
b. providing about 0.1 to 1.5 milligrams of oxygen per milligram of biochemical oxygen demand removed from said waste water in the waste water to allow said microorganisms to reduce the biochemical oxygen demand of the waste water passing therethrough; and
c. removing excess microorganism growth from said bed particles in order to increase the specific gravity of said particles such that significant amounts of biochemical oxygen demand are reduced from a volume of waste water passing through said bed in 30 minutes or less and floc produced by removal of excess growth is carried from the process without interferring with the efficient operation thereof.

4,009,099
APPARATUS AND PROCESS FOR REMOVING AMMONIA NITROGEN FROM WASTE WATER

John S. Jeris, Yonkers, N.Y., assignor to Ecolotrol, Inc., Bethpage, N.Y.

Continuation of Ser. No. 487,972, July 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 333,394, Feb. 16, 1973. This application Jan. 14, 1976, Ser. No. 648,895
Int. Cl.² C02C 1/04
U.S. Cl. 210—3 23 Claims



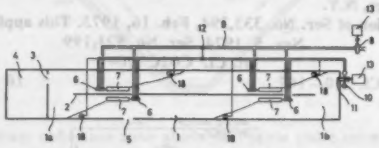
1. A biological process for removing ammonia nitrogen from waste water, which comprises
forming a fluidized bed of a solid particulate carrier having a cultured layer of nitrifying microorganisms seeded thereon,
continuously passing waste water to be treated through said fluidized bed,
adding oxygen to said fluidized bed,
retaining said waste water in said fluidized bed for a sufficient period of time while maintaining said fluidized bed at a sufficient temperature and while maintaining said fluidized bed under aerobic conditions to biologically convert substantially all of the ammonia nitrogen to be removed from the waste water to oxidized forms of nitrogen, water and cellular material, and
continuously withdrawing said oxidized forms of nitrogen and water from said fluidized bed, and removing excess of said cellular material from said particulate carrier.

16. Apparatus for biologically removing ammonia nitrogen from waste water, the combination comprising an elongated, substantially vertically disposed container, a manifold disposed towards the bottom of said container, inlet means for said manifold for receiving waste water to be processed, a fluidized bed of a solid particulate carrier having a cultured layer of nitrifying microorganisms seeded thereon, said bed being disposed in said container above said manifold, means for adding oxygen to said fluidized bed, said fluidized bed being arranged to receive said waste water from said manifold and biologically convert substantially all of the ammonia nitrogen to be removed from the waste water to oxidized forms of nitrogen, water and cellular material, outlet means for said container for continuously withdrawing the so processed waste water, oxidized forms of nitrogen, and means for removing excess cellular material from said particulate carrier.

4,009,100
METHOD OF TREATING WASTE WATER WITH JET NOZZLES

Klaus Hess; Richard Stickel, both of Bad Duerkheim; Otto Nagel, Neustadt; Richard Sinn, Ziegelhausen, and Hans Daucher, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 27, 1975, Ser. No. 544,307
Claims priority, application Germany, Jan. 30, 1974, 2404289
Int. Cl.² C02C 1/08
U.S. Cl. 210—14 11 Claims

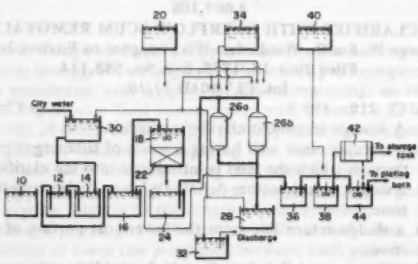


1. A process for the treatment of waste water in activated-sludge systems by means of one or more aerating nozzles which comprises introducing from a nozzle or nozzles submerged in a body of waste water and activated sludge in a reservoir a gas stream of air or a high-oxygen gas or parallel, contiguous streams of air or a high oxygen gas and a propellant liquid into a small impulse exchange tube positioned contiguous to and axially downstream of said nozzle or nozzles, said nozzle or nozzles being positioned asymmetrically to the center of gravity of a transverse, cross sectional plane of said body of waste water and activated sludge and near the bottom of said body, producing a directional flow from the environment of the nozzle or nozzles in the reservoir by impulse exchange between the mass flow leaving the nozzle or nozzles at an average impulse density of from 10^3 to 10^4 N/m² and the mixture of waste water and activated sludge in said body flowing more slowly at an average impulse density of from 50 to 10^3 N/m², and superimposing on said directional flow a rotary motion by the column of ascending bubbles emerging from the impulse exchange tube or tubes asymmetrically to said center of gravity and near the bottom of said body to provide a screw type flow of the mixture of waste water and activated sludge.

4,009,101
RECYCLE TREATMENT OF WASTE WATER FROM NICKEL PLATING

Toshio Hayashi, Inuyama, Japan, assignor to Kayabakogyo-Kabushiki-Kaisha, Tokyo, Japan

Continuation of Ser. No. 403,768, Oct. 5, 1973, abandoned.
This application Sept. 15, 1975, Ser. No. 613,086
Claims priority, application Japan, Mar. 29, 1973, 48-35992; Mar. 29, 1973, 48-35995
Int. Cl.² B01D 15/04
U.S. Cl. 210—28 8 Claims



1. A method of treating acidic nickel plating waste water for recycling to nickel plating baths, comprising the steps of;

adding an alkaline substance to a body of nickel plating waste water which includes dissolved nickel and other dissolved metallic components which can be precipitated as hydroxides, so as to increase the pH of said body to a level of about 7.5 at which said other metallic components precipitate as hydroxides but at which substantially all of said nickel remains in solution;

separating said waste water from the resulting precipitate;

adsorbing nickel from said waste water subsequent to said separation by contacting said waste water with a cation exchange resin maintained at a pH value of about 11.5.

desorbing adsorbed nickel from said resin by contacting the resin with sulfuric said thereby obtaining an acidic nickel-containing solution;

dividing said solution into a first portion and a second portion; adding an alkali to said first portion to raise the pH value thereof to about 10 for precipitating nickel hydroxide from said first portion;

recovering said nickel hydroxide;

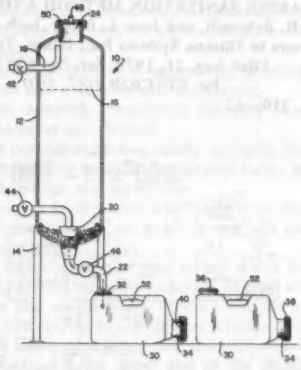
combining at least part of said recovered nickel hydroxide with said second portion of said solution to react with excess parts of said sulfuric acid so as to reduce the amount of free sulfuric acid in said second portion and form a nickel sulfate solution suitable for recycling to nickel plating baths;

and recycling said solution to nickel plating baths.

4,009,102
CONTAINERIZED WATER REFINER EXCHANGE SYSTEM

Stephen H. Davis, Dayton, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed May 19, 1976, Ser. No. 688,041
Int. Cl.² C02B 1/16, 1/40, 7/76
U.S. Cl. 210—33 7 Claims



1. A containerized water refiner exchange system comprising:

a fixed water refiner of relatively large size,

said water refiner including a relatively large volume refining chamber for holding a relatively large supply of water treating granular material,

a raw water inlet into said chamber,

a refined water outlet from said chamber,

a granular material discharge outlet from a lower portion of said chamber for gravity removal of granular material therefrom,

a filling opening into said chamber for depositing granular material therein,

a plurality of rigid, portable containers of small size relative to the size of said refining chamber,

said plurality of portable containers having a combined volume no greater than the volume of said refining chamber, and

a receiving opening in each of said containers complementary to said discharge outlet from said chamber for receiving a portion of said granular material therefrom.

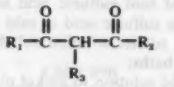
4,009,103

METHOD FOR IMPROVING THE FILTERABILITY OF ALUMINUM SALTS PRECIPITATED FROM AQUEOUS SOLUTIONS

Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed July 12, 1976, Ser. No. 704,704
Int. Cl.² C02C *5/02*
U.S. Cl. 210—51 **5 Claims**

1. A method for improving the filterability of aluminum salts precipitated from an aqueous solution containing soluble aluminum ions which method comprises adjusting the pH of the solution to between about 4 and 6, adding to the solution less than a stoichiometric amount based on the molar concentration of the aluminum ion of a 1, 3-dicarbonyl compound having the general formula



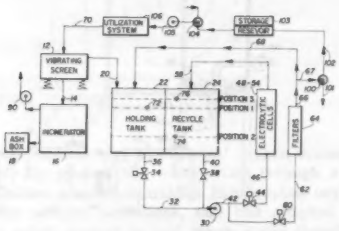
wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen, hydroxyl, alkoxy and alkyl groups to precipitate a portion of the aluminum ion as the unsoluble aluminum dicarbonyl and then adding a sufficient amount of alkaline hydroxide to precipitate the remaining aluminum ion in the form of insoluble aluminum hydroxide to obtain a mixed aluminum salt precipitate which is easily filterable.

4,009,104

MARINE SANITATION METHOD AND DEVICE

George H. Behrendt, and Jesse L. Potter, both of Dallas, Tex., assignors to Filteron Systems Inc., Dallas, Tex.

Filed Aug. 21, 1975, Ser. No. 606,486
Int. Cl.² C02B *1/82, 3/10*
U.S. Cl. 210—62 **7 Claims**



3. An automatic marine sewage treatment unit comprising:
a. storage means including a first tank and a second tank,
b. a sewage inlet channel leading to said first tank including a separator for removal of solids above a predetermined size from incoming salt water based sewage,
c. circulation means responsive to liquid levels in said tanks for batch transfer of liquids from said first tank to said second tank and for circulating a steam of liquids from and to said second tank while filling said first tank,
d. electrolytic treatment means in said circulation means for subjecting said stream to D.C. current flow, and
e. means to discharge treated liquids from said second tank when said first tank reaches a control level and for delivering a predetermined fraction of said treated liquids to said first tank.

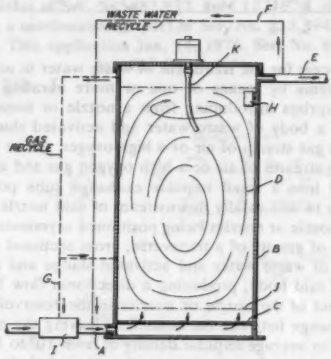
4. An automatic marine sewage treatment method comprising the repetitive cycle:
a. accumulating sewage laden salt water in a first tank while circulating sewage laden salt water from a second tank through an electrolytic cell and back to said second tank for build up of hypochlorite levels therein, and
b. responsive to liquid levels in said tanks, batch transferring a minor fraction of liquid from said second tank to said first tank while eliminating a major fraction of liquids from said second tank and then batch transferring a major fraction of liquid in said first tank to said second tank.

4,009,105

WASTE TREATMENT APPARATUS

John S. Jeris, Yonkers, N.Y., assignor to Ecolotrol, Inc., Bethpage, N.Y.

Division of Ser. No. 333,394, Feb. 16, 1973. This application Nov. 5, 1974, Ser. No. 521,199
Int. Cl.² C02C *1/04*
U.S. Cl. 210—107 **10 Claims**



1. Apparatus for biologically removing biochemical oxygen demand from waste water, comprising an elongated, substantially vertically disposed container, a manifold disposed towards the bottom of said container and adapted to control the passage of waste water therethrough, inlet means for said container for receiving waste water to be processed, a fluidized bed of a solid particulate carrier having a cultured layer of microorganisms adapted to oxidize biochemical oxygen demand seeded thereon, said fluidized bed being disposed in said container above said manifold, means for adding oxygen to said fluidized bed, said fluidized bed being arranged to receive said waste water from said manifold and to biologically convert substantially all said biochemical oxygen demand to be removed from the waste water to carbon dioxide, water and cellular material, outlet means for said container for continuously withdrawing the so processed waste water and carbon dioxide and means for removing excess cellular material from said particulate carrier.

4,009,106

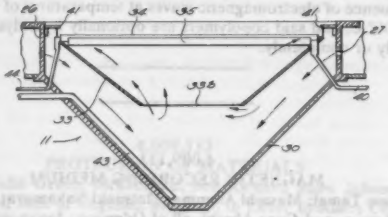
CLARIFIER WITH OVERFLOW SCUM REMOVAL

George W. Smith, Waukesha, Wis., assignor to Envirex Inc.

Filed June 18, 1975, Ser. No. 588,114
Int. Cl.² B01D *21/10*
U.S. Cl. 210—195 S **10 Claims**

1. A sewage treatment clarifier comprising
1. a circular outer wall having a series of submerged ports through which the feed is introduced into the clarifier,
2. a steep conical bottom defining a lower sludge collection zone,
3. a sludge return line from the lowermost portion of said zone,
4. a circular overflow launder which establishes the normal liquid level within the clarifier and which includes a valve-controlled effluent line from said launder,

5. a circular scum trough between said launder and said wall and extending above said liquid level and having a withdrawal pipe from said trough,
6. a frusto-conical baffle having its larger periphery upward and spaced from said wall and above said ports, the underside of said baffle and said wall defining therebetween



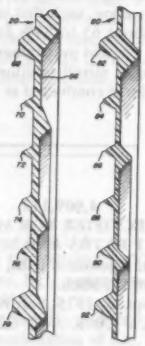
a scum collection zone above said ports and a scum and sludge separation zone below said ports, said scum trough being disposed adjacent to said scum separation zone closing of said effluent line and nominal raising of the liquid level within the clarifier is effective to lift the scum so that it overflows into the scum trough from which it is then discharged.

4,009,107

MULTI-LEVEL SUPPORT MEMBER FOR USE WITH SEMIPERMEABLE MEMBRANE

Jimmy L. Miller, Waukegan; Burton Salkin, Schaumburg; William J. Schnell, Arlington Heights, and Ludwig Wolf, Jr., Barrington, all of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,541
Int. Cl.² B01D *13/00*
U.S. Cl. 210—321 B **2 Claims**



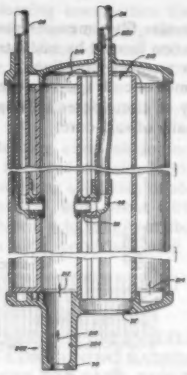
1. An elongated flexible support member for use in a coil dialyzer to support an elongated, tubularlyshaped, semipermeable membrane, said support member comprising: an elongated imperforate fluid impermeable web; means on at least one side of said web defining a plurality of elongated, generally parallel, membrane engaging ribs for supporting said membrane and for maintaining said membrane in spaced relation to said web, said rib means being arranged in generally angular relation to the length of said member, said ribs including a plurality of high ribs spaced from each other, and a plurality of lower ribs positioned between each pair of adjacent high ribs, said lower ribs being of at least two different heights so as to provide a support member having ribs of at least three different height.

4,009,108

DIALYZER CONSTRUCTION

Jimmy L. Miller, Waukegan; Burton Salkin, Schaumburg, and William J. Schnell, Arlington Heights, all of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,614
Int. Cl.² B01D *13/00*
U.S. Cl. 210—321 B **13 Claims**



1. A coil dialyzer adapted for upright positioning which includes:
a hollow centrally positioned core assembly,
a blood inlet conduit extending axially upwardly from within said core assembly and coupled to said core assembly,
a tubular semipermeable membrane coupled adjacent one end to said core assembly for communication with said inlet conduit,
a support member positioned to engage said membrane and wound about said core with said membrane,
an outlet jack assembly coupled to the said membrane adjacent the other end thereof,
a blood outlet conduit extending axially upwardly from said outlet jack assembly and coupled to said outlet jack for receiving flow from said membrane,
a housing having a body within which said core assembly, said membrane, said support member and jack assembly are positioned, and
said housing including bottom cap means which define a central dialysis solution outlet generally aligned with said hollow core and means which define a dialysis solution inlet offset with respect to said dialysis solution outlet and aligned with said wound membrane and support member, and means adjacent the upper end of the dialyzer for providing fluid communication between the top of said wound membrane and support member and the top of said hollow core assembly so as to define a dialysis solution flow path upwardly through said dialysis solution inlet, through said wound membrane and support member, into the top of said core and downwardly through said core to said dialysis solution outlet.

4,009,109

FLUID FILTER FLOW ARRANGEMENT

Leo D. Tullier, 4727 Bayou Vista, Houston, Tex. 77018, and John F. Vignone, 8282 61 Drive, Flushing, N.Y. 11379

Filed Dec. 15, 1975, Ser. No. 641,098
Int. Cl.² C02C *1/14*
U.S. Cl. 210—447 **5 Claims**

1. An arrangement for filtering fluid flow in a conduit comprising:

a. a T connection having a body including a hollow projection and a pair of aligned hollow projections extending laterally therefrom for forming flow passages and to form a filter receiving section of uniform size throughout its longitudinal extent;

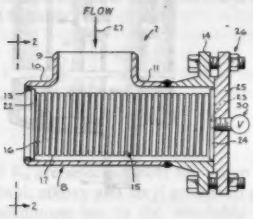
b. an inwardly extending annular flange formed on one of said aligned hollow projections and projecting radially inwardly of said aligned hollow projections to define one end of the filter receiving section;

c. an external annular flange formed on the other of said projections;

d. a hollow annular filter member positioned in the filter receiving section formed by said lateral projections, said annular filter member including:

1. a core formed of coils spaced a predetermined amount;

2. a plurality of circumferentially spaced ribs extending longitudinally of said core;



3. said ribs having a surface secured to said core;

4. an annular flange formed on one end of said core for seating on said inwardly extending annular flange and to retain said core in uniform spaced relation inwardly relative to said pair of aligned hollow projections;

5. an annular flange formed by the other end of said core to retain said core in uniform spaced relation inwardly relative to said pair of aligned hollow projections; and

e. a flange secured with said external annular flange and engaging said annular flange formed by the other end of said core for closing said other end of said core and retaining said core seated on said inwardly extending flange and spaced inwardly uniformly of said pair of aligned hollow projections throughout the extent of said uniform sized filter receiving section.

4,009,110

COPOLYMERS OF MALEIC ANHYDRIDE, DIKETENE AND ALKYL ETHERS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Rosemarie Topfl, Dornach, and Richard Von Rutte, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

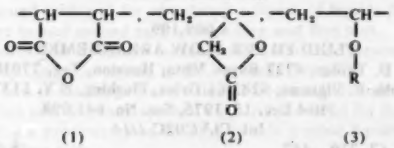
Filed June 26, 1975, Ser. No. 590,544

Claims priority, application Switzerland, July 16, 1974, 9765/74

Int. Cl.² D06T *1/00*; C08F *2/46*; C08G *2/00*, *2/26*

U.S. Cl. 252—8.9 **9 Claims**

1. Copolymers which contain recurring units of the formulae



(1) (2) (3)

wherein R represents alkyl of 1 to 22 carbon atoms, each molecule containing on average together 6 to 300 units of the formulae (1), (2) and (3) and the ratio of the units of the formulae (1), (2) and (3) in the molecule is 1: (0.7 to 0.9): (0.3 to 0.1), or the hydrolysis products thereof, which are obtained by polymerisation of maleic anhydride, diketene and a vinyl alkyl ether the alkyl moiety of which contains 1 to 22 carbon atoms, in an organic solvent which is inert to the reactants, in the presence of radical initiators or under the influence of electromagnetic waves at temperatures of −20° to +100° C, and said copolymers are optionally hydrolysed partially or completely.

4,009,111

MAGNETIC RECORDING MEDIUM

Yasuo Tamai; Masashi Aonuma; Matsuaki Nakamura; Hiroshi Agawa, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 498,337, Aug. 19, 1974, Pat. No. 3,943,012. This application Oct. 20, 1975, Ser. No. 624,017

Claims priority, application Japan, Aug. 18, 1973, 48-92721

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.² B22F *3/00*; H01F *1/02*; C22C *1/04*

U.S. Cl. 252—62.55 **6 Claims**

1. A magnetic recording medium comprising a support having thereon a magnetic recording layer comprising a binder and a ferromagnetic alloy powder, said magnetic recording layer having a coercive force of about 700 to 1500 oersteds in the oriented direction of the ferromagnetic powder and a residual magnetic flux density of about 1500 gausses or higher, the residual magnetic flux density of which after storage for 160 hours in an atmosphere of 60° C and 90% RH is 85% or higher of the initial value thereof before said storage, and said ferromagnetic alloy powder comprising the reaction product of reducing a mixed solution containing Fe, Co and Cr ions with a borohydride compound reducing agent, said mixed solution containing metal ions ranging from 0.01 to 0.5 mole/liter in concentration, such that said ferromagnetic alloy powder comprises about 65 to 89% Fe, about 7 to 34% Co, and about 0.5 to 5% Cr, said percentages being by weight, and wherein the reducing in mixed solution to prepare said ferromagnetic alloy powder is conducted at −10° C to about 40° C.

4,009,112

PELLETIZED RECTIFIER FOR MOLTEN NEUTRAL SALT BATHS AND METHOD

Robert W. Foreman, Bloomfield Hills, Mich., assignor to Park Chemical Co., Detroit, Mich.

Filed Sept. 5, 1975, Ser. No. 610,619

Int. Cl.² C09K *3/00*; C21D *1/00*

U.S. Cl. 252—71 **8 Claims**

5. A method of rectifying molten neutral salt baths comprising introducing into said bath a pellet product means for rectifying molten neutral salt baths and being made from a composition comprised of in weight percent,

a. about ½% to about 75% of ammonium chloride to yield HCl upon thermal degradation,

b. about 25% to about 99½% of at least one non-alkaline neutral binder material means for maintaining said product in a generally pellet form, said material being selected from at least one of the group consisting of alkali metal and alkaline earth metal chlorides, fluorides, and bromides,

said molten neutral salt baths being of the type which are generally maintained at a temperature between about 1300° F. and 2300° F.,

said pellet product means being capable of acting as a generally non-sludge forming rectifier when introduced into a molten neutral salt bath and acting to rectify undesirable materials of the oxides type which tend to form in the neutral salt bath, and

said pellet product means being operative to dissolve in the neutral salt bath after being introduced therein.

4,009,113

PROTECTION OF MATERIALS

Robin John Green, Birkenhead, and Richard Shaw Johnson, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 247,127, April 24, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,753

Claims priority, application United Kingdom, Apr. 30, 1971, 12379/71

Int. Cl.² C11D *9/42*

U.S. Cl. 252—95 **18 Claims**

1. An alkali stable, water dispersible, precursor-containing body for use in an alkaline powder detergent composition, consisting essentially of:

a. about 40% to about 80% by weight of the body of a finely divided, particulate precursor compound capable of reacting with hydrogen peroxide in an aqueous medium that will form a peracid bleaching species below 60° C, said particulate precursor compound being capable of passing through a mesh screen of about 0.15 mm; and

b. an inert carrier material of lauric acid, sodium dodecyl hydrogen phthalate, sodium dodecyl hydrogen succinate, sodium lauryl sulphate, or liquid paraffin, said carrier material being substantially evenly distributed with said precursor compound to form a composite particle having an outer protective, non-deliquescent, coherent layer of polyvinyl alcohol, a polyacrylamide, a starch, a water-soluble cellulose ether or a water-soluble gum for preventing aqueous alkaline attack on said precursor compound;

said precursor-containing body having a diameter of from about 0.3 mm to about 3.00 mm.

4,009,114

NON-PHOSPHATE DETERGENT COMPOSITION

Joseph A. Yurko, Bayonne, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 508,229, Sept. 23, 1974, abandoned, which is a continuation of Ser. No. 323,829, Jan. 15, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,151

Int. Cl.² C11D *1/22, 3/08, 3/10*

U.S. Cl. 252—109 **10 Claims**

1. A detergent composition devoid of phosphate or nitrogen-containing builders comprising

a. about 12–16% by weight of a linear alkyl aryl sulfonate having an average alkyl chain length of about 10 to 16 carbon atoms;

b. about 8–12% by weight of a soap selected from water-soluble salts of higher fatty acids or resin acids;

c. about 12–25% by weight of citric acid or a water-soluble salt of citric acid; and

d. about 45–75% by weight of a builder salt mixture of alkali metal silicates and alkali metal carbonates, wherein the ratio of silicate to carbonate is 1:0.25–4.

4,009,115

COMPOSITION AND METHOD FOR CLEANING ALUMINUM AT LOW TEMPERATURES

Robert Eric Binns, Roslyn, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 442,726, Feb. 14, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,154

Int. Cl.² C11D *7/08, 1/72*

U.S. Cl. 252—142 **6 Claims**

1. An aqueous cleaning composition for removing and dissolving aluminum fines and cleaning lubricating oils from aluminum surfaces comprising of from about 1 to about 10 grams/liter of sulfuric acid and from about 0.005 to about 0.1 grams/liter of hydrofluoric acid.

2. The composition of claim 1, wherein the pH is from about 1.0 to about 1.8.

6. An aqueous cleaning composition for removing and dissolving aluminum fines and cleaning lubricating oils from aluminum surfaces consisting essentially of about 3 to about 5 grams/liter of sulfuric acid, from about 0.01 to about 0.03 grams/liter of hydrofluoric acid, and from about 0.1 to about 10 grams/liter of an alkyl polyethoxylated ether nonionic surfactant.

4,009,116

PROCESS OF PREPARING SUBSTANTIALLY ORGANIC WASTE LIQUIDS CONTAINING RADIOACTIVE OR TOXIC SUBSTANCES FOR SAFE, NON-POLLUTIVE HANDLING, TRANSPORTATION AND PERMANENT STORAGE

Werner Bähr, Speyer; Stefan Drobnik, Blankenloch; Werner Hild, Hochstetten; Reinhard Kroebel, Leopoldshafen; Alfred Meyer, Cologne, and Günter Naumann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Dec. 20, 1974, Ser. No. 534,772

Claims priority, application Germany, Dec. 20, 1973, 2363474

Int. Cl.² G21F *9/16*

U.S. Cl. 252—301.1 W **8 Claims**

1. In the process of preparing a substantially organic waste liquid containing a radioactive or toxic substance for safe, non-pollutive handling, transportation and permanent storage by solidifying the liquid with a hardening material, the improvement which comprises mixing the liquid with a polymerizable mixture consisting essentially of at least one monomeric monovinyl compound, at least one monomeric polyvinyl compound and a polymerization catalyst and then polymerizing the resulting mixture into a solid homogeneous block at a temperature of from 15° to 150° C., the waste liquid being employed in an amount of from 20 to 75% by weight, based on the total weight of the waste liquid and the polymerizable mixture, the monovinyl compound being employed in an amount of 70 to 99% by weight, based on the total weight of the monomers, the polyvinyl compound being employed in an amount of from 1 to 30% by weight, based on the total weight of the monomers, and the polymerization catalyst being used in an amount of from 0.05 to 6% by weight, based on the total weight of the monomers.

4,009,117

METHOD OF MAKING INVERT WATER-IN-OIL EMULSION

Thomas D. Newingham, West Chester, and Alexander D. Recchuite, Boothwyn, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 5, 1975, Ser. No. 628,853

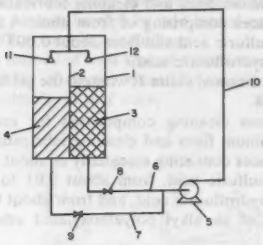
Int. Cl.² B01J *13/00*

U.S. Cl. 252—309 **5 Claims**

1. Method of making an invert water-in-oil emulsion in a predetermined water to oil volume ratio (W:O) in the range of 0.25:1 to 1.5:1 which comprises:

a. providing containers for water and for oil containing a surface active agent;

b. rapidly supplying the water to the oil containing the surface active agent and supplying the water and oil mixture to the suction side of an open-face centrifugal pump while maintaining the resulting oil-water mixture in said pump at a temperature of 50°–140° F, the rate at which the water is supplied to the oil being such that the time for the water addition is not greater than three times the time required to pump the total water-oil volume through the pump;



c. circulating the effluent from the pump through a nozzle having a cross-sectional area smaller than the discharge of said pump to provide additional shearing action on said oil-water mixture;

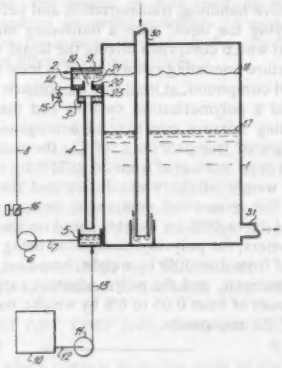
d. repeating steps (b) and (c) as many times as necessary until an emulsion of the water in the oil is achieved wherein said emulsion has a particle size of less than 2 microns.

4,009,118

METHOD AND APPARATUS FOR USING FROTH PREVENTIVES

Reino Laiho, Pori, Finland, assignor to Rauma-Repola Oy., Finland

Filed Aug. 14, 1975, Ser. No. 604,876
Int. Cl.² B01D *19/04*
U.S. Cl. 252—321 **10 Claims**



1. A method for distinguishing foam on a body of foam-forming liquid and for rendering said liquid non-foaming and suitable for handling or subsequent treatment, said method comprising:

a. forming a first treating mixture containing a catalyst-like foam preventive agent and a member of the group consisting of a foam-forming liquid, liquid formed from extinguished foam of said foam-forming liquid, and mixtures of said foam-forming liquid and extinguished foam;

b. collecting a foamed body of said foam-forming liquid in a reservoir zone, said body of liquid having a layer of foam floating thereon;

c. transferring a portion of said floating foam from said reservoir zone to a treating zone, said treating zone and said reservoir zones comprising separate liquid-handling systems;

d. contacting said transferred foam in said treating zone with said first treating mixture to extinguish said foam to form a second treating mixture in said treating zone diluted with respect to foam preventive agent, said second treating mixture comprising said first treating mixture and liquid formed from said extinguished foam;

e. repeatedly circulating at least a portion of said foam preventive-containing treating mixtures within said treating zone while contacting said treating mixture with successive bodies of fresh foam withdrawn from the surface of the liquid in the reservoir zone, thereby extinguishing said foam while forming a succession of circulating treating mixtures within said treating zone containing progressively diluted foam preventive agent in said mixtures thereby diminishing the effectiveness of said foam preventive agent;

f. withdrawing portions of said circulating treating mixture containing diluted foam preventive agent from said treating zone;

g. adding said withdrawn portions of the body of liquid in said reservoir zone; and

h. adding fresh foam preventive agent to the remaining circulating treating mixture in the treating zone in an amount sufficient to regain an effective foam extinguishing concentration.

8. Apparatus for extinguishing foam floating on a body of foam-forming liquid comprising:

a. a reservoir for receiving a body of foam-forming liquid having a layer of foam thereon;

b. a first receptacle having communicating means connecting said first receptacle with an upper part of said reservoir for receiving overflow of foam from said reservoir;

c. a second receptacle disposed beneath said first receptacle having first connecting means for permitting gravity flow of liquid between said first and second receptacles, said first connecting means having edges extending upward into said first receptacle to form trough-like means for collection of liquid therein, the edges of said first connecting means being at a higher level than the communicating means between said reservoir and said first receptacle;

d. elongated discharge means extending generally vertically downward from said second receptacle, said elongated discharge means being of sufficient diameter to permit gravity flow of foam and liquid therethrough, said elongated discharge means also extending upward into said second receptacle;

e. nozzle means in said first receptacle for directing foam extinguishing composition into foam overflowing from the reservoir;

f. a third receptacle disposed beneath said elongated means to receive a liquid mixture of foam extinguishing agent and extinguished foam; and

g. means for recycling said liquid mixture to said nozzle means.

4,009,119

AQUEOUS ANTIFOAMING EMULSIONS

Franz Poschmann, Limburgerhof, and Wolfram Bergold, Heidelberg, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 307,536, Nov. 17, 1972, abandoned. This application Mar. 20, 1975, Ser. No. 560,118
Claims priority, application Germany, Nov. 17, 1971, 2157033
Int. Cl.² B01D *19/04*
U.S. Cl. 252—358 **5 Claims**

1. In an aqueous antifoaming emulsion containing from

about 50 to 80% by weight of water and from about 20 to 50% by weight of non-aqueous water-insoluble components, said non-aqueous water-insoluble components including at least 50% by weight of fatty alcohols of from 12 to 22 carbon atoms or fatty acid esters of dihydric or trihydric alcohols of from 12 to 22 carbon atoms in the fatty acid component or mixtures of said fatty alcohols and esters as defoamers, said emulsion further containing from about 2 to 20% by weight, based on the weight of said non-aqueous components of a surface-active anionic, cationic or non-ionic emulsifier, the improvement wherein the average particle size of the emulsified water-insoluble portions is from 4 to 9 μ.

4,009,120

PROCESS FOR THE REGENERATION OF A SOLID BED METAL PHTHALOCYANINE CATALYST SYSTEM

Lee Hilfman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 18, 1975, Ser. No. 605,798
Int. Cl.² B01J 31/40; C10G 19/00
U.S. Cl. 252—413 12 Claims

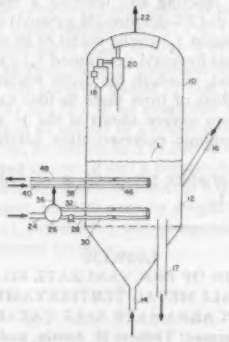
1. In a process for the regeneration of a catalyst system comprising a metal phthalocyanine impregnated charcoal support which is deactivated as a result of the treatment of a petroleum distillate with caustic and oxygen or air in the presence of said support wherein mercaptans are substantially converted to disulfides, said process comprises washing said charcoal support with liquid water and a carboxylic acid at a temperature of about 200° to about 350° F. to extract caustic and hydrocarbonaceous materials at a pressure of from about 1 atmosphere to about 100 atmospheres, the improvement which comprises treating said washed charcoal support with superheated steam at a temperature of about 650° to about 1,000° F. at a pressure of from 1 atmosphere to about 100 atmospheres and reimpregnating the steam-treated charcoal support at reimpregnation conditions with from about 0.001 weight percent to about 10.000 weight percent of a metal phthalocyanine compound.

4,009,121

METHOD OF TEMPERATURE CONTROL IN CATALYST REGENERATION

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 26, 1975, Ser. No. 607,764
Int. Cl.² B01J 37/14, 21/20; F27B 15/16
U.S. Cl. 252—417 5 Claims



1. A method for removing heat from a bed of fluidized solid catalyst particles undergoing regeneration in a regenerator of a fluid catalytic conversion unit wherein excess heat is liberated by combustion of carbonaceous deposits from the catalyst surface with an oxygen-containing gas, which comprises the steps of generating steam in a first tubular coil located in said bed of fluidized catalyst by indirect heat exchange between water and said bed of fluidized catalyst undergoing regeneration; maintaining the pressure in said first tubular coil such as to maintain the inner surface of said first tubular coil essentially wet, the pressure in said first tubular coil ranging from about 50 to about 800 psig and the total surface area of said first tubular coil ranging from about 100 square feet to about 5,000 square feet; injecting water drops into the steam effluent of said first tubular coil, and introducing the resulting mixture of steam and water drops into a second tubular coil located in said bed of fluidized solid catalyst particles, said second tubular coil being maintained at a lower pressure than said first tubular coil, said lower pressure being such as to maintain the inner surface of said second tubular coil essentially dry, the pressure in said second tubular coil ranging from about 20 to about 650 psig and the total surface area of said second tubular coil ranging from about 200 square feet to about 15,000 square feet.

4,009,122

NOVEL GLYCOL SOLUBLE MOLYBDENUM CATALYSTS AND METHOD OF PREPARATION

Ellwood L. Lines, Westville; John A. Herbst, Madison, and Robert J. Fairbrother, Wallingford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed June 23, 1975, Ser. No. 589,346
Int. Cl.² B01J 31/02
U.S. Cl. 252—431 N 22 Claims

1. A method of preparing a molybdenum catalyst comprising:

reacting at elevated temperatures between about 70° and about 160° C an oxygen-containing molybdenum compound selected from the group consisting of molybdenum dioxide, molybdenum sesquioxide, molybdenum trioxide, the ammonium salt of molybdic acid, and mixtures of these, with about 1.5 to about 20 moles of an alkylene glycol per mole of molybdenum and about 0.1 to about 4 moles of an amine per mole of molybdenum, the amine being selected from the group consisting of:

a. a compound of the formula $R_1R_2R_3N$ wherein R_1, R_2 and R_3 are each independently selected from the group consisting of hydrogen, unsubstituted alkyls having about 1 to about 10 carbon atoms, and unsubstituted aryls having about 5 to about 10 carbon atoms, with the proviso that at least one of R_1, R_2, and R_3 is not hydrogen, and

b. an N-oxide of a tertiary amine compound of the above formula.

4,009,123

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710.
This application Nov. 14, 1975, Ser. No. 632,041
Int. Cl.² B01J 27/06
U.S. Cl. 252—441 13 Claims

1. An acidic catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.5 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the cobalt and tin is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions.

4,009,124

BASIC MIXED CARBONATE OF COPPER AND ALUMINUM AND PROCESS FOR MANUFACTURING A COPPER-CONTAINING CATALYST

Peter Rudolf Laurer, Ludwigshafen; Wolfgang Schroeder, Bad Durkheim; Herwig Hoffmann, Frankenthal, and Heinz Lingk, Bobenheim-Roxheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 15, 1975, Ser. No. 613,525

Int. Cl.² B01J *21/04, 23/72*

U.S. Cl. 252—463 **4 Claims**

1. Basic mixed carbonate of copper and aluminum of the formula

$$Cu_mAl_2(CO_3)_{2.5m}O_3(OH)_{m+12}$$

where m is a number between 2 and 6.

4,009,125

SPHERICAL REFINING CATALYST AND PROCESS FOR ITS MANUFACTURE

Herbert Geierhaas, Nussloch; Willi Ripperger, Frankenthal, and Walter Herrmann, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 28, 1975, Ser. No. 599,524

Claims priority, application Germany, Aug. 19, 1974, 2439745

Int. Cl.² B01J *21/04, 23/88*

U.S. Cl. 252—465 **5 Claims**

1. A process for manufacture of spherical refining catalysts which comprises granulating by agitation in a powder mixer having moving mixing elements, a spray dried catalyst powder composed of 3 to 6% by weight of cobalt oxide or nickel oxide or mixtures thereof and from 12 to 15% by weight of molybdenum oxide, based on the total catalyst, and Al_2O_3 as the carrier, said Al_2O_3 carrier containing not more than 30% by weight of γ-Al_2O_3, adding an aqueous solution of a peptizing agent during the granulation step, and thereafter drying and calcining the resultant spherical granules.

4,009,126

CATALYST FOR REMOVING ACETYLENIC IMPURITIES

Cecil G. McFarland, League City, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 443,752, Feb. 19, 1975, abandoned. This application July 7, 1975, Ser. No. 593,724

Claims priority, application Canada, Nov. 28, 1975, 214813

Int. Cl.² B01J *23/78, 23/80*

U.S. Cl. 252—473 **6 Claims**

1. A catalyst for reducing the amount of acetylenic compounds in a stream of organic compounds consisting essentially of Zn ferrite, $NiCO_3$, and NaOH, Fe being present as the major metal component, and Ni being present in the range of about 0.25 to 20 weight percent based on total catalyst, and about 0.5 to 30 weight percent of Na based on the other metallic elements.

4,009,127

OXATRICYCLO COMPOUNDS USEFUL AS PERFUMING AGENTS

Günther Ohloff, and Wolfgang K. Giersch, both of Bernex, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

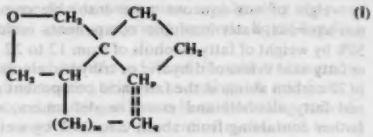
Filed June 20, 1975, Ser. No. 588,909

Claims priority, application Switzerland, June 21, 1974, 8516/74

Int. Cl.² C07D *307/77*

U.S. Cl. 252—522 **7 Claims**

1. A compound of formula (I)



(I)

wherein:

a. m = 6, p = 0 or 1, q = 1 or 2;

b. m = 7, p = 0 or 1, q = 1 or 2; or

c. m = 8, p = 0 or 1, q = 1 or 2

and in which the dotted lines represent a single or a double bond.

4,009,128

POLYMERIZATION OF EPOXIDES

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 14, 1975, Ser. No. 540,934

Int. Cl.² C08G *65/18, 65/20, 65/24, 65/12*

U.S. Cl. 260—2 A **10 Claims**

1. A process for polymerizing epoxides wherein the epoxy group is an oxirane ring comprising contacting at least one of said epoxides at a temperature below 0° C. with at least a catalytic amount of an organoaluminum compound having the formula $AlRX_2$ where R is alkyl, cycloalkyl, aryl or alkaryl and X is alkyl, aryl, cycloalkyl, hydrogen, halogen, alkoxy, acetoxy, stearoxy or benzoxy in the presence of at least 0.1 mole, per mole of aluminum, of a perhalogenated aliphatic monoketone.

4,009,129

COPOLYMERS OF CYCLIC VINYL ETHERS AND CYCLIC ACETALS

Anthony Joseph Papa, St. Albans, and William Robert Proops, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 392,497, Aug. 29, 1973, Pat. No. 3,893,985, which is a division of Ser. No. 146,843, May 25, 1971, Pat. No. 3,784,594. This application May 5, 1975, Ser. No. 574,710

Int. Cl.² C08J *9/00*

U.S. Cl. 260—2.5 F **14 Claims**

1. A process for producing cellular polymerization products which comprises reacting and foaming a reaction mixture comprising: (a) a di-(3,4-dihydro-2H-pyranyl) compound, (b) a hydroxyl-substituted 1,3-cyclic acetal or an ester condensation product of said hydroxyl-substituted 1,3-cyclic acetal and a dicarboxylic acid, in which the cyclic nucleus of said 1,3-cyclic acetal consists of from three to four carbon atoms in addition to the two oxygen atoms at the 1- and 3-positions thereof, (c) a cationic polymerization catalyst, and (d) a blowing agent.

5. A cellular product produced in accordance with the process of claim 1.

4,009,130

PREPARATION OF ISOCYANURATE FOAMS USING ALKALI METAL TERTIARYAMINO DITHIOCARBAMATE SALT CATALYSTS

Robert L. Zimmerman; Thomas H. Austin, and Heinz Schulze, all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed June 11, 1975, Ser. No. 585,906

Int. Cl.² C08G *18/22*

U.S. Cl. 260—2.5 AB **6 Claims**

1. In a process for preparing a cellular polymer containing recurring isocyanurate and urethane linkages which polymer comprises the reaction product obtained by bringing together

in the presence of a blowing agent a polyether or polyester polyol, an aromatic polyisocyanate, and an isocyanurate group formation catalyst; the improvement which comprises utilizing as said isocyanurate catalyst in at least a catalytic amount an alkali metal tertiaryamino dithiocarbamate salt.

4,009,131

POWDER COATING COMPOSITIONS AND METAL OBJECTS COATED THEREWITH

Eugene Richard Farone, Mentor, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 218,576, Jan. 17, 1972, abandoned. This application Oct. 2, 1972, Ser. No. 293,872

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 R **8 Claims**

1. A solid, particulate composition of matter comprising:

A. a solid addition polymer containing a substantial proportion of units derived from at least one of acrylic and methacrylic acids and esters thereof and at least about 5% by weight of units derived from at least one polymerizable, unsaturated epoxyalkyl ester or ether; and

B. in combination therewith, at least one polymer containing a plurality of aliphatic carboxylic acid groups separated by intervening structure which includes straight chains of 2–30 carbon atoms, said polymer having a first acidic dissociation constant no greater than 10^{-3}.

4,009,132

SIZING AGENT FOR GLASS FIBERS

Jun-ichi Furukawa; Yoshinao Kono, both of Wakayama, and Kahei Sakaguchi, Ichikawa, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

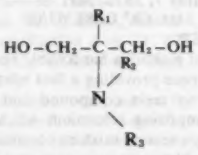
Filed Dec. 23, 1975, Ser. No. 643,690

Claims priority, application Japan, Dec. 24, 1974, 49-1558

Int. Cl.² C08L *67/08, 67/06*

U.S. Cl. 260—29.2 UA **9 Claims**

1. A sizing agent for glass fibers comprising a film-forming substance, a lubricant for glass fibers, a coupling agent and an antistatic agent, said sizing agent being characterized in that an oil-in-water type emulsion of an unsaturated polyester is used as the film-forming substance, said oil-in-water type emulsion being prepared by reacting under heating (a) 1 mole of a dibasic acid component containing at least 50 mole % of fumaric acid of maleic anhydride, (b) 1 to 1.5 moles of a diol component containing at least 30 mole % of an adduct of 2 to 10 moles of an alkylene oxide to bisphenol A, (c) 5 to 30 parts by weight, per 100 parts by weight of said polyester-forming raw materials (a) and (b), of an emulsifier selected from the group consisting of an adduct of 5 to 200 moles of an alkylene oxide to castor oil, an adduct of 5 to 200 moles of an alkylene oxide to hardened castor oil and a polyethylene glycol having an average molecular weight of 1,000 to 6,000 and (d) 0.1 to 3.0 parts by weight, per 100 parts by weight of the sum of the raw materials (a), (b) and (c), of a compound represented by the following general formula:



wherein R_1, R_2 and R_3 each stand for a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and mixing the resulting unsaturated polyester with water.

4,009,133

ELECTRODEPOSITABLE EPOXY RESINS HAVING QUATERNARY GROUPS CARRYING BLOCKED NCO, AND AQUEOUS DISPERSIONS

James E. Jones, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 601,111

Int. Cl.² C25D *13/06*; C08F *8/30, 8/34*; C08G *18/58*

U.S. Cl. 260—29.2 TN **12 Claims**

1. A hydroxyl group-containing resinous vehicle suitable for use in cationic electrodeposition comprising the acidified reaction product of:

A. an organic polyepoxide,

B. an organic tertiary amine which contains blocked isocyanate groups or organic thioether which contains blocked isocyanate groups said blocked isocyanate groups capable of unblocking at elevated temperatures to crosslink said resinous vehicle.

4,009,134

AQUEOUS ALKALINE DISPERSION OF VINYL PYRIDINE COPOLYMER, POLYMETHYLOL GLYCOLURIL, AND R-F NOVOLAK

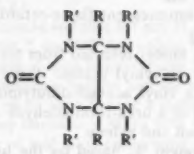
Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 404,480, Oct. 9, 1973, Pat. No. 3,895,163. This application Mar. 17, 1975, Ser. No. 559,105

Int. Cl.² C08G *12/34*; C08L *61/10, 61/28*

U.S. Cl. 260—29.3 **6 Claims**

1. A composition of matter useful in adhering glass fibers to rubber and consisting essentially of an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 2 to 32 parts by weight of at least one water soluble polymethylolglycoluril compound having the formula



where R is hydrogen, methyl or ethyl and where R′ is hydrogen or methylol, at least two of the R's being methylol, from about 2 to 24 parts by weight of at least one water soluble, thermoplastic and non heat hardenable resorcinol-formaldehyde novolak, said novolak having been made by the reaction of formaldehyde or paraformaldehyde with resorcinol under acid conditions, from about 0 to 3 parts by weight of an alkaline material selected from the group consisting of NH_4OH, KOH and NaOH, and from about 150 to 1100 parts by weight of water.

4,009,135

ADDITIVE FOR MORTAR AND CONCRETE

Albrecht Harreus, Kelkheim, Taunus; Eberhard Müller, Frankfurt am Main, and Gerhart Schultz, Darmstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 4, 1974, Ser. No. 512,097

Claims priority, application Germany, Oct. 4, 1973, 2349910

Int. Cl.² C08L *61/20*

U.S. Cl. 260—29.4 UA **3 Claims**

2. An additive for mortar or concrete, said additive containing (a) from 10 to 50 percent by weight of an aqueous solution of a polycondensate of formaldehyde and an amino-s-triazine modified with sulfite or sulfonic acid, said solution having a solids content of about 25 percent by weight, and (b) from 90

to 50 percent by weight of an aqueous dispersion of a polymer of at least one olefinically-unsaturated monomer, said dispersion having a pH value greater than 7, a solids content of about 50 percent by weight, and being prepared by an aqueous emulsion polymerization of said monomer or monomers.

4,009,136

MULTICOLOR COATING COMPOSITIONS

Edward W. Lewandowski, Ottsville, Pa., and Frank Koebert, Normandy, Mo., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 5, 1974, Ser. No. 476,508
Int. Cl.² C08L *29/14*
U.S. Cl. 260—29.6 RB **12 Claims**

1. A process for the preparation of a sprayable, brushable, and rollable multicolor coating composition consisting essentially of the steps of a) forming a viscous solution of a pigmented polyvinyl acetal resin dissolved in an organic solvent, and b) adding one or more of said solutions with controlled agitation to an aqueous polymer latex, whereby solvent migration from the mix to the latex causes an increase in viscosity of the mix thereby forming pigmented shear resistant droplets or globules in the latex.

4,009,137

INTUMESCENT FLAME-RETARDANT COATING COMPOSITIONS

Franz-Josef Dany, Erftstadt Lechenich; Joachim Wortmann, Turnich, and Joachim Kandler, Erftstadt Lechenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Cologne, Germany

Filed Nov. 26, 1974, Ser. No. 527,446
Claims priority, application Germany, Nov. 30, 1973, 2359699
Int. Cl.² C08L *31/04*
U.S. Cl. 260—29.6 MP **5 Claims**

1. An improved intumescent flame-retardant coating composition comprising

a. a film-forming binder selected from the group consisting of an aqueous polyvinyl acetate dispersion, an aqueous dispersion of a vinyl acetate-dibutylmaleate copolymer and a solution of a urea-formaldehyde resin in a solvent blend of butanol and xylene,

b. about 5–25 weight %, based on the total weight of the composition, of an ammonium polyphosphate,

c. a substance carbonizing under the action of heat selected from the group consisting of dicyanamide, pentaerythritol, melamine and mixtures thereof, and

d. a dispersing agent, the improved coating composition containing as the b) component an ammonium polyphosphate of the formula

$$H_{(n-m)+3}(NH_4)_mP_nO_{3n+1}$$

wherein n is an average whole number of about 600–800 and the ratio of m/n is about 1.

4,009,138

PROCESS FOR PRODUCING STABLE EMULSION OF POLYMER

Toshiyuki Kobashi, and Kenichi Masuhara, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Japan

Filed Apr. 3, 1975, Ser. No. 564,892
Claims priority, application Japan, Apr. 6, 1974, 49-39153
Int. Cl.² C08L *33/02*
U.S. Cl. 260—29.6 RW **10 Claims**

1. A process for preparing a stable polymer emulsion characterized by polymerizing a radical-polymerizable monomer having unsaturated bond by using a water-soluble catalyst in an aqueous medium and in the presence of a water-soluble polymer containing chemically bonded monomeric units of methacrylic acid or its salt and monomeric units of ethylenically unsaturated sulfonic acid or its salt, said polymerization being conducted at a pH of 4 or lower.

4,009,139

OPACIFYING AGENTS

Rudi Widder, Leimen; Paul Diessel, Mannheim, and Dieter Distler, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 22, 1975, Ser. No. 579,884
Claims priority, application Germany, June 24, 1974, 2430301
Int. Cl.² C08L *25/06, 25/14;* C11D *3/37*
U.S. Cl. 260—29.6 RW **6 Claims**

1. Opacifying agents for liquid detergent, cleaner and cosmetic compositions and which are stable in compositions containing detergents and electrolytes consisting essentially of an aqueous dispersion having a solids content of 30 to 50% by weight and a particle size of 0.2 to 1 μm and produced by the free radical polymerization of styrene or styrene with up to 50% by weight, based on the resultant copolymer, of an alkyl acrylate or an alkyl methacrylate respectively having 1–5 carbon atoms in the alkyl group in aqueous emulsion in the presence of 1 to 10% by weight, based on the total monomers, of sodium polyacrylate having a K value according to H. Fikentscher of from 15 to 35 and from 1 to 8% by weight of the sarcoside of an unsaturated carboxylic acid having from 12 to 20 carbon atoms in the hydrocarbon radical, the solid particles in said dispersion having a softening point of above 90° C.

4,009,140

CLEAR ETHYLENE POLYMER EMULSIONS HAVING LIGHT TRANSMISSION OF AT LEAST 95% AND POLISHES CONTAINING THE SAME

Glenn E. Teer; Jerry G. Higgins, and George D. Warren, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Division of Ser. No. 540,848, Jan. 14, 1975. This application Aug. 22, 1975, Ser. No. 606,835
Int. Cl.² C08L *23/16*
U.S. Cl. 260—29.6 XA **17 Claims**

1. A clear latex comprising emulsion polymerized polymer particles selected from polymers and copolymers of ethylene which have an average size no larger than about 100 angstrom units, and which are suspended within an aqueous medium comprising water and an anionic emulsifier, and are prepared under greater than atmospheric pressure and at a temperature of from about 70° C to about 150° C in the presence of said anionic emulsifier, a water soluble salt of persulfuric acid and an alkyl mercaptan, said latex having a light transmission of at least about 95%.

4,009,141

ELECTRICAL INSULATING COMPOSITIONS OF EPOXY RESINS, ZIRCONIUM SILICATE AND ALUMINA

Frank S. Nichols, Pittsfield; Charles H. Bliss, Hancock, and Robert J. Londergan, Pittsfield, all of Mass., assignors to General Electric Company, New York, N.Y.

Filed July 7, 1972, Ser. No. 269,771
Int. Cl.² C08L *63/00*
U.S. Cl. 260—37 EP **6 Claims**

1. The method of making a hardenable epoxy resin composition which comprises providing a first mixture comprising a cycloaliphatic epoxy resin compound and a finely divided filler material comprising zirconium silicate and hydrated alumina, providing a second mixture comprising an anhydride curing agent for said epoxy resin compound and a finely divided filler material comprising zirconium silicate, and thereafter mixing together said first mixture and said second mixture for curing said epoxy resin compound.

4,009,142

SULFONSUCCINIC ACID SEMI-ESTERS, PROCESS FOR THEIR PREPARATION AND THEIR USE IN PIGMENT PREPARATIONS FOR AQUEOUS FLEXO PRINTING PASTES

Reinhold Deubel, Altenhain, Taunus; Max Grossmann, Frankfurt am Main; Volker Hemmerling, Schwalbach, Taunus, and Heinz Uhrig, Steinbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 458,523, May 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 267,513, June 29, 1972, abandoned. This application Feb. 27, 1975, Ser. No. 553,633

Claims priority, application Germany, June 30, 1971, 2132404

Int. Cl.² C08R *9/04*

U.S. Cl. 260—38 1 Claim

1. Pigment preparations containing as a dispersing agent 0.1 to 0.2 parts by weight, based on one part by weight of dry pigment powder, of a sulfosuccinic acid semiester obtained by acid condensation of a monoalkylphenol containing an alkyl group with 6 to 14 carbon atoms with formaldehyde in a molar ratio of from 2 : 1 to 10 : 9, oxalkylating the novalac thus obtained with 2 to 25 moles of 1,2-propylene oxide or ethylene oxide per phenolic hydroxy group, reacting the oxalkylate thus obtained with maleic acid anhydride and reacting the maleic acid semi-ester thus obtained with an alkali metal or alkali earth metal sulfite, bisulfite or pyrosulfite.

4,009,143

PROCESS FOR PRODUCING CARBONACEOUS SUBSTANCES FOR USE IN SYNTHETIC-GRAPHITE AND GRAPHITE-LIKE BODIES

Hartmut Luhleich, Duren; Hubertus Nickel, Julich; Peter Pflaum, Julich, and Francesco Dias, Julich, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed June 29, 1972, Ser. No. 267,480

Claims priority, application Germany, June 30, 1971, 2132492

Int. Cl.² C08K *3/04*

U.S. Cl. 260—38 4 Claims

1. A process for producing a carbonaceous mass for the production of shaped bodies, comprising the steps of:

slurrying particles of a carbonaceous filler selected from the group which consists of graphite, coke and carbon black in a binder at least partly dissolved in a solvent and selected from the group which consists of phenol-formaldehyde resin to produce a slurry of binder-coated particles;

continuously dispersing said slurry by supplying it from a nozzle continuously into a codirectionally-flowing continuous stream of a liquid in which said binder is at most slightly soluble and which is miscible with said solvent to form discrete binder-coated grains of the filler; and

decanting excess quantities of said liquid from said discrete binder-coated grains to form said mass.

4,009,144

SPRAYABLE DECORATIVE COATING COMPOSITION

Sidney Offerman, Great Neck, N.Y., assignor to Grow Chemical Corporation, New York, N.Y.

Division of Ser. No. 338,601, March 6, 1973, Pat. No. 3,929,692. This application Aug. 21, 1975, Ser. No. 606,450

Int. Cl.² C08K *3/00;* C08L *67/00*

U.S. Cl. 260—40 R 4 Claims

1. A pre-mix additive composition for a sprayable liquid coating material for unfinished concrete to seal the same and enhance the acoustical and flame retardant properties thereof comprising calcium carbonate, synthetic fibrous material selected from the group consisting of polyamides and polyesters and silicates selected from the group consisting of magnesium silicate and calcium silicate.

4,009,145

FILLING COMPOUNDS

Thomas Hunt, Llancarfan, near Barry, Wales, assignor to BP Chemicals International Limited, England

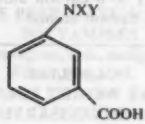
Filed July 28, 1975, Ser. No. 599,403

Claims priority, application United Kingdom, Aug. 5, 1974, 34390/74

Int. Cl.² C08K *3/00;* C08L *67/06*

U.S. Cl. 260—40 R 8 Claims

1. An unsaturated polyester filling compound which comprises an unsaturated polyester, a monomer that is copolymerisable therewith, a filler, an accelerator and an aromatic tertiary amine promoter having the formula



in which X and Y may be the same or different and represent alkyl of 1 to 6 carbon atoms or alkylol of 1 to 6 carbon atoms, or esters thereof.

4,009,146

METHOD OF AND MIXTURE FOR ALUMINIZING A METAL SURFACE

Frank Cork, Alvaston; David Frederick Bettridge, Chaddesden; and Philip Charles Clarke, Derby, all of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Aug. 14, 1974, Ser. No. 497,470

Claims priority, application United Kingdom, Sept. 19, 1973, 44032/73; Apr. 19, 1974, 17163/74

Int. Cl.² C08K *3/08*

U.S. Cl. 260—42.22 7 Claims

1. A coating mixture suitable for use in aluminizing a metal surface comprising 5 to 50% by weight of an organic resin binder evaporatable at high temperatures, 2 to 25% by weight of one or more inorganic halides and the balance being finely divided particles of an alloy having a melting point of at least 1100° C, said alloy containing 40 to 60% by weight of aluminum, the balance of said alloy comprising one or more metals selected from the group consisting of iron, cobalt, nickel and zirconium, and at least one solvent to adjust the viscosity of the coating mixture to that required for the particular method chosen of application of the mixture to the metal surface to be aluminized, the coating mixture providing, in use, a reaction with the inorganic halide or halides with the aluminum forming volatilized aluminum halide in the vicinity of the coated metal surface to be aluminized and providing a substantially uniform aluminized layer deposited on the metal surface.

4,009,147

COMPOSITION OF ANTIOXIDANTS OF REDUCED VOLATILITY

Bernard J. Lyons, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

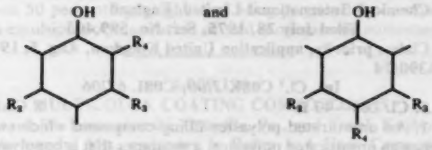
Division of Ser. No. 481,740, June 21, 1974, Pat. No. 3,986,981, which is a continuation-in-part of Ser. No. 150,831, June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 660,198, Aug. 14, 1967, abandoned. This application July 7, 1975, Ser. No. 593,643

Int. Cl.² C08K *5/37, 5/13*

U.S. Cl. 260—45.95 B 47 Claims

1. A polymer composition comprising a normally oxidizable polymer and an effective antioxidant amount of an antioxidant composition comprising a mixture of bisphenolic polymers of the formula H —[Z—Y—X—]$_n$ H wherein n is an integer of from 2 to about 12 and wherein Y is independently chosen from the group consisting of sulfur, methylene and butylidene,

and for each bisphenolic repeating unit —Z—Y—X— Z and X are independently selected from the group consisting of



R_2 and R_3 being independently selected from the group consisting of hydrogen and alkyl, cycloalkyl, aryl and alkaryl groups having from 1 to 8 carbon atoms, R_4 being an alkyl group of from 4 to 8 carbon atoms.

4,009,148

HIGH MOLECULAR WEIGHT POLYCARBONATES OF α,α,α,α',α',α'-HEXAKISARYL-1,3-AND/OR -1,4-DIMETHYL BENZENES

Dieter Neuray, Rumeln-Kaldenhausen; Erhard Tresper, Krefeld, and Dieter Freitag, Krefeld-Traar, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

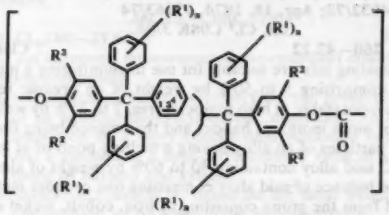
Filed May 21, 1975, Ser. No. 579,532

Claims priority, application Germany, May 24, 1974, 2425291

Int. Cl.² C08G 17/13

U.S. Cl. 260—47 XA **10 Claims**

1. High molecular weight polycarbonates based on aromatic dihydroxy compounds containing from 5 mol % to 100 mol %, based on incorporated dihydroxy compounds, of structural units corresponding to the formula (V):



(V)

in which

R^1 represents C_1–C_4 alkyl, halogen or H;

$n = 1$, 2 or 3; and

R^2 and R^3, independently of one another, represents C_1–C_3 alkyl, halogen or H.

4,009,149

AMORPHOUS THERMOPLASTIC AROMATIC POLYSULPHONE

Terence King, New Barnet, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

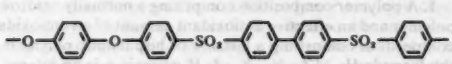
Filed Jan. 17, 1973, Ser. No. 324,430

Claims priority, application United Kingdom, Nov. 8, 1972, 51441/72; Dec. 22, 1972, 59313/72

Int. Cl.² C08G 75/23

U.S. Cl. 260—49 **1 Claim**

1. An amorphous thermoplastic aromatic polysulphone consisting of repeating units having the formula



and having a Tg of about 260° C.

4,009,150

TIME-LAPSE FREE-RADICAL POLYMERIZABLE COMPOSITION

Parry McWhinnie Norling, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 457,385, April 2, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,482

Int. Cl.² C08F 20/10, 120/14

U.S. Cl. 260—63 UY **10 Claims**

1. A polymerization medium which comprises

1. free-radical polymerizable compound which is an ethylenically unsaturated monomers;

2. polymerization initiator soluble in the polymerization medium selected from the group consisting of

a. diacyl peroxides,

b. ketone peroxides,

c. alkyl peroxy esters,

d. dialkyl peroxides, and

e. inorganic persulfates

in the amount of 10^{-4} to 10^{-1} mole of polymerization initiator per mole of free radical polymerizable compound;

3. reducible metal chelate soluble in the polymerization medium selected from the group consisting of iron and copper chelates in which the chelating agent is selected from the group consisting of

a. βdicarbonyl compounds having an enol content of at least 4 percent and a dicarbonyl angle of not greater than 120° , and

b. β-hydroxy nitrogen-heterocyclic fused aromatics in which the hydroxyl group is attached to a carbon beta to the nitrogen in an adjacent ring in the amount of 10^{-4} fo 10^{-1} mole of reducible metal chelate per mole of free radical polymerizable compound;

4. organic reducing agent soluble in the polymerization medium which is capable of reducing ferric ions to ferrous ions or cupric ions to cuprous ions in the amount of 10^{-3} to 10^{3} moles of reducing agent per mole of reducible metal chelate, and

5. excess chelating agent selected from the group consisting of

a. β-dicarbonyl compounds having an enol content of at least 4 percent and a dicarbonyl angle of not greater than 120° , and

b. β-hydroxy nitrogen-heterocyclic fused aromatics in which the hydroxyl group is attached to a carbon beta to the nitrogen in an adjacent ring, in the amount of 10^{-4} to 2.5 moles of excess chelating agent per mole of reducible metal chelate.

4,009,151

POLYMERS OF 2-VINYL-FLUORENONE AND DERIVATIVES THEREOF

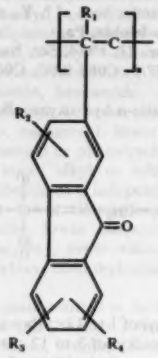
James M. Pearson, Webster, and John F. Yanus, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 494,014, Aug. 1, 1974, abandoned, which is a division of Ser. No. 411,577, Oct. 31, 1973. This application Oct. 30, 1975, Ser. No. 627,167

Int. Cl.² C08G 2/16, 2/18

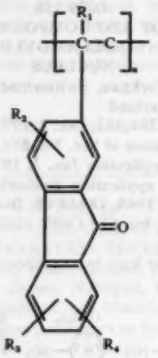
U.S. Cl. 260—63 K **5 Claims**

1. A homopolymeric composition consisting of repeating units characterized by the structural formula:



wherein R_1 is hydrogen or methyl, R_2, R_3 and R_4 are hydrogen or aliphatic groups containing from 1 to 4 carbon atoms and n is a number representing the degree of polymerization.

5. A copolymeric composition consisting of units characterized by the structural formula:



wherein R_1 is hydrogen or methyl, R_2 R_3 and R_4 are hydrogen or aliphatic groups containing from 1 to 4 carbon atoms and N is a number representing the degree of polymerization which are copolymerized with another vinyl monomer selected from the group consisting of styrene, vinyl chloride, methyl methacrylate, vinyl carbazole, vinyl naphthalene, isoprene, butadiene, a substituted styrene, acrylonitrile, vinyl pyridine and vinyl acetate.

4,009,152

DIISOCYANATO-DIKETENES

Werner Mormann, and Kuno Wagner, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

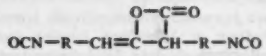
Filed Aug. 22, 1975, Ser. No. 606,914

Claims priority, application Germany, Sept. 5, 1974, 2442426

Int. Cl.² C07D *305/12*; C08G *18/06*

U.S. Cl. 260—77.5 AT **6 Claims**

1. Diisocyanato-diketenes corresponding to the following general formula:



wherein

R represents a straight or branched-chain aliphatic hydrocarbon radical with from 3 to 10 carbon atoms.

4,009,153

VAPOR-PHASE PREPARATION OF AROMATIC POLYAMIDES

Hyunkook Shin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Filed Mar. 4, 1975, Ser. No. 555,244

Int. Cl.² C08G *69/32*

U.S. Cl. 260—78 R **8 Claims**

1. A process for the preparation of film-forming aromatic polyamides by direct vapor phase condensation of one or more aromatic diamines and one or more aromatic diacid halides which comprises vaporizing the diamine(s) and diacid halide(s), mixing the vaporized diamine and diacid halide in the presence of an inert diluent gas and reacting the mixture in a reaction zone at a temperature between about 150° C and 500° C for at least 0.01 second, and collecting the aromatic polyamide.

4,009,154

PROCESS FOR PREPARING AROMATIC POLYAMIDES WITH SODIUM CARBONATE HYDRATE AS ACID ACCEPTOR

Takashi Noma, Hino; Hiroshi Fujie, Iwakuni, and Shuji Ozawa, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 29, 1975, Ser. No. 582,403

Claims priority, application Japan, June 3, 1974, 49-61786; Aug. 1, 1974, 49-87490

Int. Cl.² C08G *69/48*, *69/28*

U.S. Cl. 260—78 SC **5 Claims**

1. A process for preparing a fiber-forming aromatic polyamide, which comprises contacting (I) a solution or dispersion, in a polar, non-basic and inert organic liquid medium, of a low molecular weight aromatic polyamide having an inherent viscosity of no greater than 0.2 as measured in a solution of 0.5 gram of the polyamide in 100 ml. of concentrated sulfuric acid at 30° C., with (II) an aqueous slurry consisting of a dispersion in water of a sodium carbonate hydrate in a concentration of at least 5% by weight, said solution or dispersion (I) being a product obtained by reacting an aromatic diamine and an aromatic dicarboxylic acid halide in said liquid medium.

4,009,155

P-CARBOXYPHENYL-AZOXYCARBONITRILE AND ITS METHYL ESTER

Hamao Umezawa; Tomio Takeuchi; Hironobu Iinuma, all of Tokyo, and Osamu Tanabe, Kowata Ugi, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

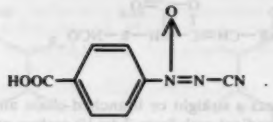
Filed Sept. 5, 1974, Ser. No. 503,553

Claims priority, application Japan, Sept. 14, 1973, 48-103200; Oct. 29, 1973, 48-120705

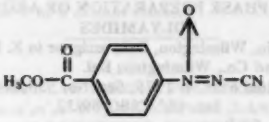
Int. Cl.² C07C *105/00*

U.S. Cl. 260—141 **5 Claims**

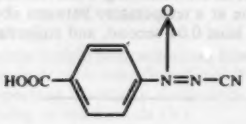
1. The compound having the formula



4. The methyl ester of calvatic acid having the formula



5. The process for producing the compound of claim 4 which comprise reacting the compound having the formula



with diazomethane.

4,009,156

HYDROXYNAPHTHALENE TRISAZO DYESTUFFS

Hans Kramb, Barcelona, Spain, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

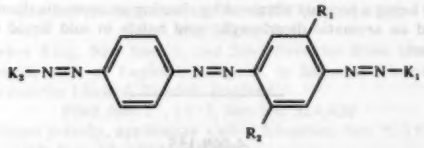
Filed Apr. 25, 1975, Ser. No. 571,865

Claims priority, application Germany, May 4, 1974, 2421654

Int. Cl.² C09B *31/22, 31/28, 33/20, 35/38*

U.S. Cl. 260—169 **3 Claims**

1. Trisazo dyestuff which in the form of the free acid corresponds to the formula



wherein

K_1 is 2,8-dihydroxynaphthalene-6-sulfonic acid, coupled in alkaline medium, or 2-amino-8-hydroxynaphthalene-6-sulfonic acid, coupled in acidic medium,

K_2 is hydroxyphenyl, 2-sulpho-hydroxyphenyl, 2-methylhydroxyphenyl, 4-methylhydroxyphenyl, 1,3-dihydroxyphenyl, 3-aminohydroxyphenyl,

R_1 is hydrogen or methoxy, and

R_2 is hydrogen or methyl, with the proviso that the total number of sulfonic acid groups is 1 or 2.

4,009,157

PRIMARY-ALIPHATIC α-HYDROXY AZOALKANES

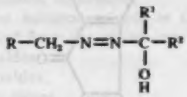
Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 21, 1974, Ser. No. 453,448

Int. Cl.² C07C *107/2;* **C08J** *9/00;* **C08F** *118/00, 120/00*

U.S. Cl. 260—192 **12 Claims**

1. Primary aliphatic-α-hydroxyazoalkane having the formula:



wherein

R is hydrogen, alkyl of 1 to 11 carbons, cycloalkyl of 3 to 12 carbons, bicycloalkyl of 3 to 12 carbons, tricycloalkyl of 3 to 12 carbons, aralkyl of 7 to 12, carbons, aryl of 6 to 14 carbons, alkaryl of 7 to 12 carbons;

R^1 is the same as R except R^1 is not hydrogen;

R^2 is the same as R except R^2 is neither hydrogen, aryl, nor alkaryl;

R^1 and R^2 taken together form an alkylene of 3 to 11 carbons.

4,009,158

MIXTURES OF AZO COMPOUNDS HAVING A 2-NITRO-4-PHENYLSULFAMOYLDIPHENYL AMINE NUCLEUS

Ruedi Altermatt, Tecknau, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

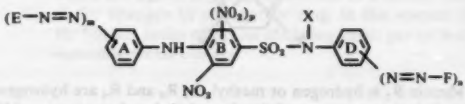
Division of Ser. No. 204,382, Dec. 2, 1971, Pat. No. 3,865,805, which is a continuation of Ser. No. 851,444, Aug. 19, 1969, abandoned. This application Jan. 3, 1975, Ser. No. 538,397

Claims priority, application Switzerland, Aug. 30, 1968, 13051/68; Dec. 19, 1968, 18944/68; Dec. 19, 1968, 18943/68

Int. Cl.² C09B *43/00*

U.S. Cl. 260—205 **8 Claims**

1. A mixture of at least two compounds of the formula



wherein

E is phenyl, substituted phenyl, naphthyl or methylsulfonylnaphthyl,

wherein each substituent of substituted phenyl is independently chloro, bromo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, cyano, thiocyano, phenoxy, formyl, acetyl, benzoyl, lower alkylsulfonyl, lower hydroxyalkylsulfonyl, benzylsulfonyl, sulfamoyl, lower alkylsulfamoyl, cyanoethylsulfamoyl, hydroxyethylsulfamoyl, dilower alkylsulfamoyl, N,N-di(cyanoethyl)sulfamoyl, N,N-di(hydroxyethyl)sulfamoyl, phenylsulfamoyl, formamido, lower alkanoylamino, chloropropionamido, benzamido, lower alkylsulfonylamino, lower alkoxycarbonyl, benzyloxycarbonyl, lower alkoxycarbonylamino, carbamoyl, lower alkylcarbamoyl, dilower alkylcarbamoyl or phenylcarbamoyl,

F is phenyl, substituted phenyl, naphthyl or methylsulfonylnaphthyl,

wherein each substituent of substituted phenyl is independently chloro, bromo, lower alkyl, lower alkoxy, phenoxy, trifluoromethyl, thiocyano, cyano, nitro, hydroxy, formyl, acetyl, benzoyl, lower alkylsulfonyl, hydroxyethylsulfo-

nyl, benzylsulfonyl, sulfamoyl, lower alkylsulfamoyl, cyanoethylsulfamoyl, hydroxyethylsulfamoyl, dilower alkylsulfamoyl, N,N-dicyanoethyl)sulfamoyl, N,N-di(hydroxyethyl)sulfamoyl, phenylsulfamoyl, lower alkylamino, cyanoethylamino, dilower alkylamino, N,N-di(-cyanoethyl)amino, N-ethyl-N-cyanoethylamino, N,N-di(-hydroxyethyl)amino, formamido, lower alkanoylamino, chloropropionamido, benzamido, methylsulfonylamino, lower alkoxycarbonyl, benzyloxycarbonyl, lower alkoxycarbonylamino, carbamoyl, lower alkylcarbamoyl, dilower alkylcarbamoyl or phenylcarbamoyl,

X is hydrogen, lower alkyl or substituted lower alkyl wherein each substituent is independently chloro, bromo, hydroxy, cyano, lower alkanoyloxy, benzoyloxy, lower alkoxycarbonyloxy, lower alkoxycarbonyl, carbamoyl, benzyloxycarbonyloxy, lower alkoxy, phenoxy, phenyl, methylcarbamoyloxy, dimethylcarbamoyloxy or phenylcarbamoyloxy,

Ring A is further unsubstituted or further substituted, with the proviso that each further substituent on Ring A is independently chloro, bromo, lower alkyl, lower alkoxy, formamido, lower alkanoylamino, benzamido, lower alkoxycarbonylamino, benzyloxycarbonylamino or chloropropionamido,

Ring D is further unsubstituted or further substituted, with the proviso that each further substituent on Ring D is independently chloro, bromo, lower alkyl, lower alkoxy, phenoxy, hydroxy, cyano, nitro, thiocyano, hydroxyethoxy, lower alkanoyloxyethoxy, formamido, lower alkanoylamino, benzamido, lower alkylsulfonyl, benzylsulfonyl, phenylsulfonyl, sulfamoyl, lower alkylsulfamoyl, methoxypropylsulfamoyl, dilower alkylsulfamoyl, acetyl, benzoyl, carbamoyl, lower alkylcarbamoyl, dilower alkylcarbamoyl or methoxypropylcarbamoyl,

m is 1 or 1,

n is 0 or 1,

with the proviso that m + n is 1, and

p is 0 or 1.

4,009,159

HALOGENATED PENAM DERIVATIVES AND THE PREPARATION THEREOF

Takashi Kamiya, Suita; Yoshihisa Saito, Takarazuka; Tsutomu Teraji, Hirakata; Osamu Nakaguti, Osaka; Teruo Oku, Kyoto; Hitoshi Nakamura, and Masashi Hashimoto, both of Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Japan

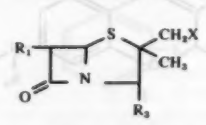
Continuation-in-part of Ser. No. 266,470, June 26, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,232

Claims priority, application Japan, June 24, 1971, 46-46158; Aug. 14, 1971, 46-61776; Aug. 14, 1971, 46-61777; Aug. 18, 1971, 46-62687; Aug. 21, 1971, 46-63885; Aug. 21, 1971, 46-63886; Sept. 9, 1971, 46-70018; Dec. 23, 1971, 46-2516

Int. Cl.[2] C07D *499/44, 499/46, 499/48, 499/64*

U.S. Cl. 260—239.1 **18 Claims**

1. Penam derivatives having the formula



wherein X represents a halogen atom, and wherein R_1 represents acylamino wherein said acyl substiuent is selected from the group consisting of formyl, acetyl, propionyl, butyryl, isobutyryl, valeryl, isovaleryl, pivaloyl, acryloyl, crotonoyl, 2-methylacryloyl, cyclopentylcarbonyl, cyclohexylcarbonyl, cycloheptylcarbonyl, cyclohexylacetyl, cycloheptylacetyl, cyclohexylpropionyl, cycloheptylpropionyl, dihydrobenzoyl, 2,4,6-cycloheptatrienylacetyl, dihydrophenylacetyl, methoxyacetyl, methylthioacetyl, 2-propenylthioacetyl, cyclohexylthioacetyl, cyclohexyloxyacetyl, dihydrophenoxyacetyl, dihydrophenylthioacetyl, cyclopentyloxycarbonyl, cyclohexyloxycarbonyl, dihydrophenoxycarbonyl, cycloheptyloxycarbonyl, benzoyl, toluoyl, naphthoyl, α- methylnaphthoyl, phthaloyl, tetrahydronaphthoyl, phenylacetyl, phenylpropionyl, phenylbutyryl, tolylacetyl, xylylacetyl, naphthylacetyl, tetrahydronaphthylacetyl, phenoxyacetyl, benzyloxycarbonyl, xylyloxycarbonyl, naphthoxycarbonyl, phenoxycarbonyl, 2-phenoxypropionyl, 2-phenoxybutyryl, 1H-tetrazolylacetyl, 2H-tetrazolylacetyl, thienylacetyl, thienylpropionyl, furylacetyl, piperazinylacetyl, pyrrolidinylacetyl, pyrrolidinylpropionyl, benzothiazolylacetyl, oxazolyacetyl, benzoxazolylacetyl, pyridylmethoxycarbonyl, 2-furyloxycarbonyl, 8-quinolyloxycarbonyl, trichloroethoxycarbonyl, tribromoethoxycarbonyl, 1 cyclo propylethoxycarbonyl, chloroacetyl, 2-chloropropionyl, trifluoroacetyl, phenylglycyl, p-aminophenylacetyl, p- nitrobenzyloxycarbonyl, o-bromo-benzyloxycarbonyl, o-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, 3,4-dimethoxybenzyloxycarbonyl, p- hydroxyphenylacetyl,2,5-dimethoxybenzoyl, 3-phenyl-5-methyl-4-oxazolylcarbonyl, 3-(2-chlorophenyl)-5-methyl-4-oxazolylcarbonyl, 3-(2,6-dichlorophenyl)- 5-methyl-4-oxazolylcarbonyl, 3-(2-chloro-6-fluorophenyl)-5-methyl-4- oxazolylcarbonyl, 2-cyanoacetyl, 2-(p-hydroxyphenyl)-2-(1-cyclopropylethoxy- carbonylamino)acetyl, 2-(sydonone-3-yl)acetyl and 3-(2-chlorophenyl)-5-methylisoxazole4-carbonyl; wherein the amino of said acyl substituent containing an amino is protected with a protective group selected from the group consisting of trichlorethoxycarbonyl, tribomoethoxycarbonyl, benzyloxycarbonyl, p- toluenesulfonyl, p-nitrobenzyloxycarbonyl, o-bromobenzyloxycarbonyl, o- nitrophenylsulfenyl, chloroacetyl, tribomoacetyl, formyl, tert-butoxycarbonyl, p-methoxybenzyloxycarbonyl, 3,4-dimethoxybenzyloxycarbonyl, 4-phenylazobenzyloxycarbonyl, 4-(4-methoxyphenylazo)benzyloxycarbonyl, pyridine- 1-oxide-2-methoxycarbonyl, 2-pyridylmethoxycarbonyl, 2-furyloxycarbonyl, diphenylmethoxycarbonyl, 1,1-dimethylpropoxycarbonyl, isopropoxycarbonyl, 1-cyclopropylethoxycarbonyl, phthaloyl, succinyl, 1-adamantyloxycarbonyl, 8-quinolyloxycarbonyl, trityl, 2-nitrophenylthio, 2,4-dinitrophenylthio, 2-hydroxybenzylidene, 2-hydroxy-5-chlorobenzylidene, 2-hydroxy- 1-naphthylmethylene, 3-hydroxy-4-pyridylmethylene, 1-methoxycarbonyl-2-propylidene, 1-ethoxycarbonyl-2-propylidene, 3-ethoxycarbonyl-2-butylidene, 1-acetyl-2-propylidene, 1-benzoyl-2-propylidene, 1-[N-(2-methoxyphenyl)carbamoyl]- 2-propylidene, 1-[N-(4-methoxyphenyl)carbamoyl]-2-propylidene, 2-ethoxycarbonylcyclohexylidene, 2-ethoxycarbonylcyclopentylidene, 2-acetylcyclohexylidene, 3,3-dimethyl-5-oxocyclohexylidene, monosilyl and disilyl; wherein the hydroxy of said acyl substituent containing a hydroxy is protected with a protective group selected from the group consisting of benzyloxycarbonyl, 4-nitrobenzyloxycarbonyl, 4-methoxybenzyloxycarbonyl, 3,4-dimethoxybenzyloxycarbonyl, 4-phenylazobenzyloxycarbonyl, 4-(4-methoxyphenylazo)benzyloxycarbonyl, tert-butoxycarbonyl, 1,1-dimethylpropoxycarbonyl, isopropoxycarbonyl, diphenylmethoxycarbonyl, 2-pyridylmethoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl, 3-iodopropoxycarbonyl, 2-furfuryloxycarbonyl, 1-adamantyloxycarbonyl, 1-cyclopropylethoxycarbonyl, 8-quinolyloxycarbonyl, trifluouroacetyl, trifluoroacetyl, trityl, methoxymethyl, 2-nitrophenylthio, and 2,4-dinitrophenylthio, and R_3 represents a radical selected from the group consisting of

1. carboxy;
2. carboxy esters selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, tert-butyl, cyclohexyl, cycloheptyl, vinyl, 1-propenyl, 2-propenyl, 3-butenyl, phenyl, xylyl, tolyl, naphthyl, benzyl, phenethyl, methoxymethyl, ethoxymethyl, methylthioethyl, methylthiomethyl, dimethylaminoethyl, diethylaminoethyl, phenoxymethyl, phenylthiomethyl, methylsulfenylmethyl, phenylsulfenylmethyl, benzoylmethyl, toluoylmethyl, chloromethyl, bromomethyl, trichloroethyl, cyano-

methyl, p-nitrophenyl, 2,4,5-trichlorophenyl, 2,4,6-trichlorophenyl, pentachlorophenyl, p-methanesulfonylphenyl, 4-phenylazophenyl, 2,4-dinitrophenyl, p-chlorobenzyl, o-nitrobenzyl, p-methoxybenzyl, p-nitrobenzyl, 3,4,5-trimethoxybenzyl, bis(p-methoxyphenyl)methyl, pentachlorobenzyl, trichlorobenzyl, 3,5-di(tert)butyl-4-hydroxybenzyl, p-nitrophenylthiomethyl, p-nitrobenzoylmethyl, p-chlorobenzoylmethyl, esters of a thioalcohol, esters of a substituted thioalcohol, N-hydroxysuccinimide, N-hydroxyphthalimide, tetrahydrofuran, 1-cyclopropylethanol, 1-phenyl-3-methyl-5-pyrazolone, 3-hydroxypyridine, 2-hydroxymethylpyridine-1-oxide, 1-hydroxy-2(1H)- pyridine, dimethylhydroxyamine, diethylhydroxyamine, glycolamide, 88-hydroxy-quinoline, 2-hydroxymethylquinoline-1-oxide, oxime, methoxyacetylene, ethoxyacetylene, tert-butylethynyldimethylamine, tert-butylethynyldiethylamine, ethylethynyldiethylamine and 2-ethyl-5-(3-sulfophenyl)isoxazolium hydroxide inner salt;

3. acid amides selected from the group consisting of N-methyl acid amide, N-ethyl acid amide, N,N-dimethyl acid amide, N,N-diethyl acid amide, N-methyl-N-ethyl acid amide, the acid amide with imidazole and the acid amide with 4-substituted imidazole;
4. acid anhydrides selected from the group consisting of a dialkyl phosphate, dibenzyl phosphate, phosphoric acid, sulfuric acid, alkyl carbonate and aliphatic carboxylic acids selected from the group consisting of pivalic acid, pentanoic acid, isopentanoic acid, 2-ethylbutanoic acid, chloroacetic acid, crotonic acid, valeric acid, propionic acid, 3-chloro-3-pentanoic acid, 3-bromo-2-butenoic acid, phenylacetic acid, phenoxyacetic acid, furanacetic acid, thiophenacetic acid and aromatic carboxylic acids;
5. acid halides selected from the group consisting of acid chloride and acid bromide;
6. acid azide;
7. carboxy salts of a metal selected from the group consisting of sodium, potassium and magnesium; and
8. carboxy salts of an amine selected from the group consisting of methylamine, diethylamine, triethylamine, aniline, pyridine, picoline and N,N-dibenzylethylenediamine.

4,009,160
AMINOMETHYLARYLMETHYLPENICILLIN DERIVATIVES

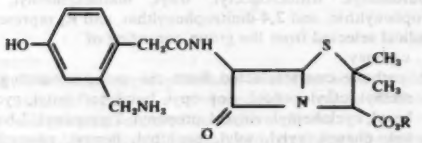
James W. McFarland, Lyme, and Colin Thomson, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 523,024, Nov. 12, 1974, Pat. No. 3,966,710. This application Feb. 17, 1976, Ser. No. 658,489

Int. Cl.² C07D *499/58*

U.S. Cl. 260—239.1 6 Claims

1. A compound selected from the group consisting of:



and the pharmaceutically acceptable salts thereof wherein R is selected from the group consisting of hydrogen, 1-(alkanoyloxy)alkyl, said alkanoyl having 2 to 8 carbon atoms and said alkyl having from 1 to 3 carbon atoms, and phthalidyl.

4,009,161
6-METHYL-2H-1,3-OXAZIN-2,4(3H)DIONE-3-SULFOHALIDES

Hartmut Pietsch, Hofheim, Taunus; Karl Clauss, Rossert, Taunus; Erwin Schmidt, Kelkheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

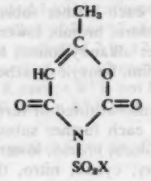
Filed July 16, 1975, Ser. No. 596,227

Claims priority, application Germany, July 18, 1974, 2434563

Int. Cl.² C07D *265/100, 273/00, 295/00*

U.S. Cl. 260—244 R 3 Claims

1. A 3-sulfohalide of 6-methyl-2H-1,3-oxazin-2,4(3H)-dione of the formula



in which X represents fluorine or chlorine.

4,009,162
BASIC OXAZINE DYESTUFFS

Eberhard Mundlos, Heusenstamm; Reinhard Mohr, and Luis Herz, both of Offenbach, Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

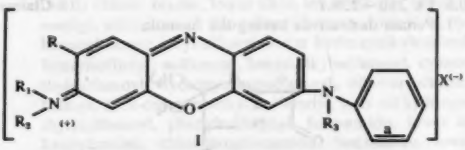
Continuation of Ser. No. 415,683, Nov. 14, 1973, abandoned, which is a continuation of Ser. No. 153,805, June 16, 1971, abandoned. This application Mar. 19, 1975, Ser. No. 560,095

Claims priority, application Germany, June 18, 1970, 2030028

Int. Cl.² C07D *265/00, 265/12, 273/00, 295/00*

U.S. Cl. 260—245 1 Claim

1. A basic oxazine dyestuff of the formula I



I

in which R is hydrogen or lower alkyl, R_1 is hydrogen or lower alkyl substituted by halogen, lower alkoxy, cyano or hydroxy, R_2 and R_3 each is hydrogen or lower alkyl or lower alkyl substituted by halogen, lower alkoxy, cyano or hydroxy, or R_1 and R_2 form together with the nitrogen atom the pyrrolidino, piperazino, piperidino or morpholino ring, and the phenyl nucleus *a* is substituted by lower alkyl, lower alkoxy, acetyl, cyano, halogen, phenoxy or trifluoromethyl, and $X^{(-)}$ is an anion.

4,009,163
AMIDINOUREAS AND AMIDINOTHIOUREAS

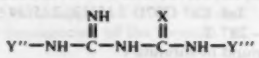
Royal A. Cutler, Sand Lake, and Samuel Schalit, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 391,473, Aug. 24, 1973, which is a division of Ser. No. 79,266, Oct. 8, 1970, Pat. No. 3,798,269, which is a division of Ser. No. 749,986, Aug. 5, 1968, Pat. No. 3,652,766, which is a continuation-in-part of Ser. No. 556,897, June 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,077, June 7, 1965, abandoned. This application June 9, 1975, Ser. No. 585,447

Int. Cl.² C07D *295/12*

U.S. Cl. 260—247.2 A 3 Claims

1. A compound having the structural formula



wherein X is oxygen or sulfur; one of Y'' and Y''' is morpholinoalkyl containing 6–10 carbon atoms and the other of Y'' and Y''' is a member of the group consisting of alkyl containing 1–18 carbon atoms, alkenyl containing 3–18 carbon atoms, alkoxyalkyl containing 3–17 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, cycloalkyl containing 3–8 carbon atoms, di(lower alkyl)aminoalkyl containing 4–10 carbon atoms and morpholinoalkyl containing 6–10 carbon atoms; and Y'' also is hydrogen when Y''' is morpholinoalkyl containing 6–10 carbon atoms.

4,009,164
NOVEL 2-SUBSTITUTED-1,2,4-THIADIAZOLO-[2,3-a]-BENZIMIDAZOLES AND PROCESS FOR THEIR PREPARATION

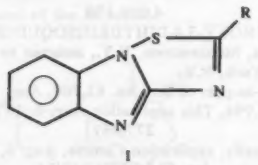
Colin C. Beard, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 622,932, Oct. 16, 1975, Pat. No. 3,976,654, which is a division of Ser. No. 523,765, Nov. 14, 1974, Pat. No. 3,946,031, which is a division of Ser. No. 403,474, Oct. 4, 1973, Pat. No. 3,880,874. This application Apr. 5, 1976, Ser. No. 675,040

Int. Cl.² C07D *417/14*

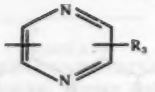
U.S. Cl. 260—250 BN 3 Claims

1. A compound represented by the formula:

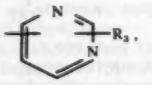


I

wherein R is



and



in which

R_3 is hydrogen, lower alkoxy, halo, nitro, or lower alkyl; or the pharmaceutically acceptable salts thereof.

4,009,165
NAPHTHOLACTAM DYES

Ernst Schefczik, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

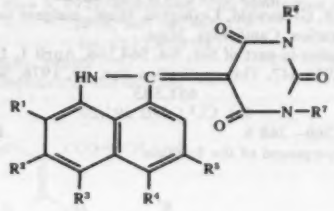
Filed May 5, 1975, Ser. No. 574,401

Claims priority, application Germany, June 11, 1974, 2428198

Int. Cl.² C07D *403/04*

U.S. Cl. 260—256.4 C 5 Claims

1. A compound of the formula



in which

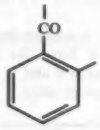
R^1 is hydrogen, chloro, bromo, C_1- to C_4-alkyl, methoxy, ethoxy or nitro,

R^2 is hydrogen or chloro,

R^3 is chloro, bromo, C_1- to C_4-alkyl, methoxy, ethoxy, nitro, acetylamino, propionylamino, benzoylamino, C_2- to C_4-alkanoyl, benzoyl or benzoyl substituted by chloro, bromo, methyl, ethyl, methoxy or ethoxy,

R^4 is hydrogen, chloro, methoxy or ethoxy,

R^3 and R^4 together are



R^5 is hydrogen, chloro, methoxy or ethoxy and

R^6 and R^7 are independently C_1- to C_8-alkyl, C_2- to C_8-alkyl substituted by hydroxy, cyano, C_1- to C_4-alkoxy or C_1- to C_4-alkoxycarbonyl, phenyl, or phenyl substituted by chloro, methyl or methoxy.

4,009,166
PYRIDO(2,3-d) PYRIMIDINONES

Kanji Noda, Chikushino; Akira Nakagawa, Tosu; Toshiharu Motomura, Tosu; Satoru Miyata, Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Japan

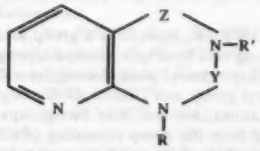
Filed June 2, 1975, Ser. No. 582,889

Claims priority, application Japan, June 12, 1974, 49-67791; July 5, 1974, 49-80367

Int. Cl.² C07D *471/04*

U.S. Cl. 260—256.4 F 30 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of phenyl,

chlorophenyl, bromophenyl, fluorophenyl, dichlorophenyl, nitrophenyl and trifluoromethylphenyl; R′ is selected from the group consisting of methyl, ethyl, propyl, isopropyl, allyl, 2-fluoroethyl, 2-hydroxyethyl, methoxymethyl and carboxymethyl; Y and Z are selected from the group consisting of carbonyl and methylene, but Y and Z are always dissimilar.

4,009,167
N-(LOWER ALKYL SULFONYL-METHYL SULFONYL)-PIPERAZINES

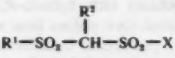
Richard B. Greenwald, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 564,166, April 1, 1975, Pat. No. 3,976,647. This application Apr. 29, 1976, Ser. No. 681,583

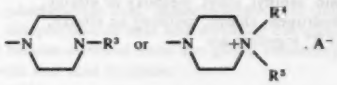
Int. Cl.² C07D *295/20*

U.S. Cl. 260—268 S **12 Claims**

1. A compound of the formula:



wherein R^1 is lower alkyl; R^2 is $+CH_2\frac{}{m}S+CH_2\frac{}{n}Y$ wherein *m* is a whole number 2 to 5, *n* is a whole number 1 to 4 and Y is hydrogen, —OH or —COOR wherein R is hydrogen or lower alkyl; and X is



wherein A is a halide or a sulfonate, R^3 is hydrogen or $+CH_2\frac{}{n}Y$ wherein *n* and Y have the same meaning given above, R^4 is $+CH_2\frac{}{n}Y$ wherein *n* and Y have the same meaning given above and R^5 is lower alkyl.

4,009,168
PYRIDINETHIOL-TIN COMPOUND AND PROCESS FOR THE PREPARATION OF THE SAME

Mitsuo Masaki; Satoshi Matsunami; Jyunichiro Kita, and Toshikazu Hayashi, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

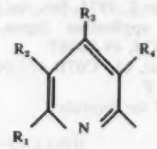
Filed Feb. 7, 1974, Ser. No. 440,382

Claims priority, application Japan, Aug. 24, 1973, 48-94306

Int. Cl.² C07D *213/70*

U.S. Cl. 260—270 K **19 Claims**

1. A pyridinethio-tin compound having the formula RS-SnX_2-SR wherein R represents a group having the formula



wherein each of R_1–R_4 represents a group selected from the group consisting of a hydrogen atom, a nitro group, a cyano group, an alkoxycarbonyl group having from 2 to 11 carbon atoms, a phenyl group, and a linear alkyl group having from 1 to 4 carbon atoms, not less than two groups among R_1–R_4 being selected from the group consisting of a hydrogen atom and said linear alkyl group, and X represents an atom which is selected from the group consisting of fluorine, chlorine, bromine and iodine.

4,009,169
8-CARBOXYLESTER, AND 8-CARBAMYL DERIVITIVES OF 5,6,7,8-TETRAHYDROQUINOLINE

Adrian Charles Ward Curran, South Cave; Roger Crossley, Reading, and David George Hill, Cookham, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

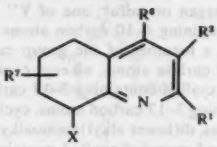
Continuation-in-part of Ser. No. 600,257, July 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,265, April 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,038

Claims priority, application United Kingdom, Oct. 21, 1972, 48595/72; Oct. 15, 1973, 7424/73; July 21, 1973, 34866/73; Aug. 16, 1973, 38701/73; Oct. 17, 1973, 48595/72

Int. Cl.³ C07D *215/32, 215/34*

U.S. Cl. 260—287 T **13 Claims**

1. A compound of formula I



and acid addition salts thereof with pharmaceutically acceptable acids, wherein R^1, R^2 and R^6 are the same or different and are selected from hydrogen, alkyl containing from 1 to 6 carbon atoms, phenylalkyl wherein the alkyl group has 1–6 carbon atoms, or phenyl groups or R^1 and R^2 taken together represent a polymethylene chain of 3 to 5 carbon atoms, R^7 represents hydrogen, alkyl of 1 to 6 carbon atoms or gem di n-alkyl of 1–6 carbon atoms, phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms or phenyl, X is $CONHR^3$ or CO_2R^5 wherein R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, and R^5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms and metal salts of the compounds wherein X is CO_2R^5 and R^5 is hydrogen with the proviso that when R^1 and R^2 or R^2 and R^6 are both alkyl they are selected from normal and secondary alkyl groups.

4,009,170
1-ETHOXY-3,4-DIHYDROISOQUINDINES

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

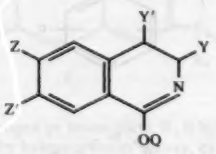
Continuation-in-part of Ser. No. 62,700, Aug. 10, 1970, Pat. No. 3,753,994. This application Aug. 1, 1972, Ser. No. 277,051

Claims priority, application Canada, Aug. 6, 1971, 120032

Int. Cl.² C07D *217/24*

U.S. Cl. 260—289 R **5 Claims**

1. 1-(QO)-3-(Y)-4-(Y′)-6-(Z)-7-(Z′)-3,4-dihydroisoquinoline of the formula



wherein Q is methyl, ethyl or propyl;

Y is hydrogen or atertiary alkyl of one to four carbon atoms;

Y′ is hydrogen, atertiary alkyl of one to four carbon atoms, phenyl, hydroxy or atertiary alkoxy of one to four carbon atoms;

Z and Z′, when taken alone, are the same or different and

are hydrogen, atertiary alkyl of one to four carbon atoms, halo, hydroxy or atertiary alkoxy of one to four carbon atoms;

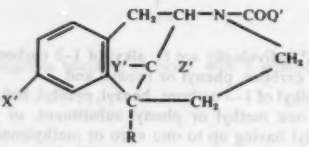
Z and Z', when taken together, are methylenedioxy; and acid addition salts thereof.

4,009,171
N-ACYLATED-11-OXYGENATED-2,6-METHANO-3-BENZAZOCINE INTERMEDIATES

Noel F. Albertson, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,487
Int. Cl.² C07D 221/26
U.S. Cl. 260—293.54 3 Claims

1. 1,2,3,4,5,6-Hexahydro-3-Q'CO-6-R-8-X'-11-Y'-11-Z'-2,6-methano-3-benzazocine of the formula



wherein

Q' is cyclopropyl;

R is methyl;

X' is hydroxy or Q'COO; and

Y' is hydrogen when Z' is hydroxy or Q'COO; or

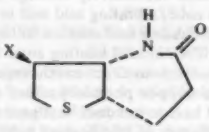
Y' is hydroxy or Q'COO when Z' is methyl.

4,009,172
2,3,3A,6,7,7A-HEXAHYDRO-THIENO[3,2-b]PYRIDIN-(4H)5-ONES

Enrico Baggiolini, Nutley; Pasquale Nicholas Confalone, Bloomfield; Giacomo Pizzolato, Belleville, and Milan Radoje Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 574,080, May 2, 1975, Pat. No. 3,957,794. This application Mar. 18, 1976, Ser. No. 668,107
Int. Cl.² C07D 495/04
U.S. Cl. 260—293.55 7 Claims

1. A compound of the formula:



wherein X is bromine or chlorine;

the racemates and optical antipodes thereof.

4,009,173
BUTYROPHENONE DERIVATIVES

Kikuo Sasajima, Toyonaka; Masaru Nakao, Osaka; Isamu Maruyama, Minoo; Keiichi Ono, Osaka; Shigenari Katayama; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation of Ser. No. 368,909, June 11, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,730
Claims priority, application Japan, June 12, 1972, 47-58789
Int. Cl.² C07D 403/04
U.S. Cl. 260—293.64 2 Claims

1. γ-(4'-piperidino-4'-carbamoylpipridino)-2-acetamino-4-fluorobutyrophenone hydrochloride.

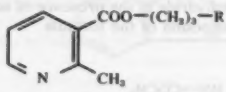
2. γ-(4'-piperidino-4'-aminomethylpiperidino)-2-acetamino-4-fluorobutyrophenone hydrochloride.

4,009,174
ESTERS OF SUBSTITUTED NICOTINIC ACIDS

Robert Cluzan, and Lazare Katz, both of Paris, France, assignors to The Boots Company Limited, Nottingham, England

Continuation-in-part of Ser. No. 313,319, Dec. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,963, May 3, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,219
Int. Cl.² C07D 405/12
U.S. Cl. 260—293.69 3 Claims

1. A compound of the formula



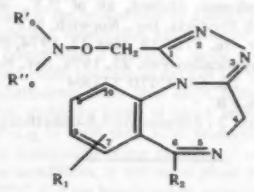
and pharmaceutically acceptable acid addition salts thereof, in which R is piperidino or pyrrolidino.

4,009,175
1-[(AMINOOXY)-METHYL]-6-SUBSTITUTED-4H-s-TRIAZOLO[4,3-a][1,4] BENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 15, 1976, Ser. No. 666,902
Int. Cl.² C07D 487/04
U.S. Cl. 260—296 T 17 Claims

1. Compounds of the formula:



III

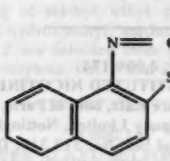
wherein R'ₒ and R''ₒ are hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; R_1 is hydrogen, fluoro, chloro, bromo, nitro, trifluoromethyl, or alkylthio in which the alkyl moiety is of 1 to 3 carbon atoms, inclusive; R_2 is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl, and 2-pyridyl or the pharmacologically acceptable acid addition salts thereof.

4,009,176
CONVERSION OF 2-AMINONAPHTHO[1,2 d] SELENAZOLE TO 2-METHYLNAPHTHO[1,2 d] SELENAZOLE

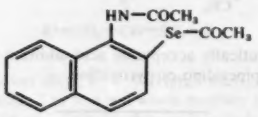
Aaron David Ezekiel, Ilford, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 510,945, Sept. 30, 1974, Pat. No. 3,969,364. This application July 30, 1975, Ser. No. 600,483
Claims priority, application United Kingdom, Oct. 19, 1973, 48778/73; Oct. 19, 1973, 48779/73
Int. Cl.² C07D 293/12
U.S. Cl. 260—298 2 Claims

1. A process for the conversion of 2-aminonaphtho[1,2-d] selenazole to 2-methylnaphtho [1,2-d] selenazole of the formula



which comprises hydrolyzing with potassium hydroxide, sodium hydroxide or a mixture containing potassium hydroxide and potassium carbonate, 2-aminonaphtho [1,2-d] selenazole in the presence of an alkali metal borohydride or ammonium borohydride at a temperature of over 130° C in a high-boiling inert solvent medium and acetylating the resultant hydrolysis product in situ with acetic anhydride in the presence of acetic acid, thus producing the compound of the formula



isolating this compound and closing the ring by refluxing it in the presence of acetic anhydride to form the 2-methylnaphtho [1,2-d] selenazole.

4,009,177

COMPOUND

2-(2-THIAZOLYL)-5,6-DIMETHOXYINDAZOLES

Thomas J. Schwan, Norwich, and Charles S. Davis, Norwich; Le Roy J. Honkomp, Oxford, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 472,719, May 23, 1974, Pat. No. 3,966,760. This application Feb. 25, 1976, Ser. No. 661,343

Int. Cl.² C07D *513/04*

U.S. Cl. 260—306.8 R **1 Claim**

1. The compound 2-(2-thiazolyl)-5,6-dimethoxyindazole.

4,009,178

BROMINATING AND OXIDIZING AGENT AND METHOD OF USING SAME

Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

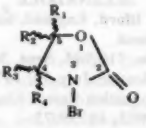
Filed June 16, 1975, Ser. No. 587,143

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.² C07D *263/22*

U.S. Cl. 260—307 C **7 Claims**

1. A compound of the formula:



wherein R_1 and R_2 which may be the same or different, each represent a member selected from the group consisting of hydrogen and a C_1-C_{22} straight or branched alkyl, and wherein R_3 and R_4 represent a C_1-C_{22} straight or branched alkyl.

4,009,179

DI- AND TRI-SUBSTITUTED OXAZOLIDIN-2-ONE OXIMES

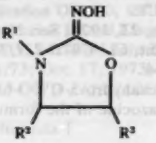
Stephen David Ziman, Richmond, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 15, 1975, Ser. No. 622,673

Int. Cl.² C07D *263/28*

U.S. Cl. 260—307 FA **8 Claims**

1. A compound of the formula



wherein

R^1 and R^2 individually are H, alkyl of 1–3 carbons, alkenyl of 2–3 carbons, phenyl or benzyl; and

R^3 is H, alkyl of 1–3 carbons, benzyl, pyridyl, indolyl having up to one methyl or phenyl substituent, or phenyl or naphthyl having up to one nitro or methylenedioxy substituent or up to two substituents of halogen, alkyl of 1–3 carbons or alkoxy of 1–3 carbons.

4,009,180

CONTINUOUS PROCESS FOR PREPARING COPPER PHTHALOCYANINE

Walter Deucker, Neuenhain, Taunus; Ernst Spietschka, Oberauroff, Taunus, and Dieter Steidl, Sulzbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 14, 1973, Ser. No. 415,633

Claims priority, application Germany, Nov. 16, 1972, 2256170

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **4 Claims**

1. A method of making copper phthalocyanine which comprises preparing an intimate mixture of phthalodinitrile and a copper salt, continually feeding said mixture to a tubular vibration mill containing heat-conductive metal bars, said vibration mill having a heating zone and reaction zone and said mixture being passed successively through said heating zone and said reaction zone, vibrating said mill to further mix and grind said mixture, causing said mixture to be heated to a temperature above 150° C. in said heating zone to cause the components of said mixture to react exothermically in said reaction zone to form copper phthalocyanine, causing said heat-conducting metal bars to conduct heat generated in said reaction zone to the mixture in said heating zone and removing copper phthalocyanine from said reaction zone of said vibration mill.

4,009,181

CYCLOPENTA[b]INDOLE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Leo Berger, Montclair, and Alfred John Corraz, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 325,764, Jan. 22, 1973, Pat. No. 3,868,387, which is a continuation of Ser. No. 133,738, April 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 40,443, May 25, 1970, abandoned. This application Dec. 12, 1974, Ser. No. 532,112

Int. Cl.² C07D *209/70*

U.S. Cl. 260—326.27 **2 Claims**

1. 7-chloro-cyclopenta[bindole-2-carboxylic acid or a salt thereof with a pharmaceutically acceptable base.

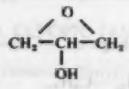
4,009,182

PROCESS FOR PREPARING 3-HYDROXYOXETANE

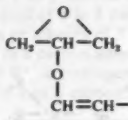
Alan E. Ardis, North Haven, and John A. Wojtowicz, East Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 557,377, June 14, 1966, Pat. No. 3,446,819. This application Aug. 22, 1968, Ser. No. 798,473
Int. Cl.² C07D 305/08
U.S. Cl. 260—333 1 Claim

1. A process for the preparation of a hydroxyoxetane of the formula:



which comprises reacting chlorine with a compound of the formula:



at a temperature of from about −20° to about 50° C in the presence of a water-acetone mixture and in the presence of calcium carbonate.

4,009,183

PROCESS FOR THE PREPARATION OF ALKYLENE CARBONATES

Carlo Fumagalli, Sirone (Como); Giuseppe Caprara, Milan, and Paolo Roffia, Mantova, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Sept. 30, 1975, Ser. No. 618,201
Claims priority, application Italy, Sept. 30, 1974, 27870/74
Int. Cl.² C07D 317/38, 317/36
U.S. Cl. 260—340.2 7 Claims

1. Process for the direct preparation of alkylene carbonates, characterized in that cyclic olefines, linear olefines and having from 2 to 15 carbon atoms is made to react in a liquid phase with carbon dioxide in the presence of a catalytic system consisting of:

a. iodine in a form selected from the group consisting of elementary iodine, alkali metal iodides, alkaline earth metal iodides, iodides of a metal selected from the group consisting of group IB, IIB, IIIA, IIIB, IVA, VA, VIIB, and VIII of the periodic table and iodohydrines of the olefine reactant, and of

b. an oxygen conveyor consisting of manganese dioxide;

at temperatures comprised between 30° and 120° C., and at pressures comprised between atmospheric pressure and 100 atm., at a pH value comprised between 3 and 8.

4,009,184

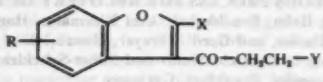
AMINO CARBONYL DERIVATIVES OF BENZOFURANS, PROCESSES FOR THEIR PRODUCTION, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

2-PHENYL-3-[3-DIALKYLAMINOPROPANOYL]BENZOFURAN COMPOUNDS

Wilhelm Kaupmann, Hannover-Kirchrode; Klaus-Wolf von Eickstedt, Berlin, and Salah-Eldin Rahman, Warnsdorf, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed June 6, 1974, Ser. No. 477,091
Int. Cl.² C07D 307/81
U.S. Cl. 260—346.2 R 10 Claims

1. An amino carbonyl benzofuran of the group consisting of compounds having the formula



in which R is hydrogen, halogen, or alkyl containing up to 4 carbon atoms, X is phenyl, halophenyl, alkylphenyl, or alkoxyphenyl, the alkyl moieties of which contain up to 4 carbon atoms, and Y is a dialkylamino radical, the alkyl moieties of which contain up to 4 carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

4,009,185

CONVERSION OF DIPHENYLETHERS TO DIBENZOFURANS USING CATALYSTS CONTAINING CERIA

Norman A. Fishel, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 8, 1975, Ser. No. 603,065
Int. Cl.² C07D 307/91
U.S. Cl. 260—346.2 M 6 Claims

1. Process for the production of a dibenzofuran compound which comprises contacting an aromatic ether compound feedstock comprising a diphenyl oxide having at least one unsubstituted ortho position in each of the phenyl rings which have no substituents other than alkyl, hydroxy, aryl, aralkyl, and alkyaryl, including forms in which an aryl ring is fused to the phenyl ring to form polycyclic aromatic groups said aromatic ether compound being capable of vaporization under the reaction conditions, in the vapor phase at a temperature of 300° to 700° C at a gas hourly space velocity of from 1 hr^{-1} to 2,000 hr^{-1} over a catalyst essentially composed of a member of the class of ceria, and combinations of ceria with an oxide of a metal of the group consisting of aluminum, silicon, magnesium, titanium, zirconium, hafnium, calcium, potassium, sodium, lanthanum, neodymium, praseodymium, samarium, thorium, and uranium and mixtures thereof, to produce a dibenzofuran compound.

4,009,186

PROCESS FOR THE PREPARATION OF MALEIC ANHYDRIDE FROM MALEIC ACID IN THE PRESENCE OF SULFOLANE

Jean-Marie Lietard, Gent, and Guido Matthijs, Mariakerke, both of Belgium, assignors to U. C. B., Societe Anonyme, Brussels, Belgium

Filed July 10, 1975, Ser. No. 594,672
Claims priority, application United Kingdom, July 12, 1974, 30938/74
Int. Cl.² C07D 307/60
U.S. Cl. 260—346.8 M 11 Claims

1. A process for the preparation of maleic anhydride by dehydration of maleic acid, which comprises heating maleic acid at a temperature of from about 100° to about 210° C

under a pressure of about 30 to about 760 mm Hg in the presence of sulfolane.

4,009,187

8-(5-FORMYL-2-FURYL)-OCTANOIC ACID

Rune Eliasson, Spanga, Sweden, and Poul Nedenskov, Birkerod, Denmark, assignors to Aktieselskabet Grindstedvaerket, Arhus, Denmark

Filed Mar. 15, 1973, Ser. No. 341,627

Claims priority, application United Kingdom, Mar. 20, 1972, 12940/72

Int. Cl.² C07D *307/46*

U.S. Cl. 260—347.3 **1 Claim**

1. 8-(5-Formyl-2-furyl)-octanoic acid.

4,009,188

CONTINUOUS PROCESS FOR RECOVERY OF GLYCIDE

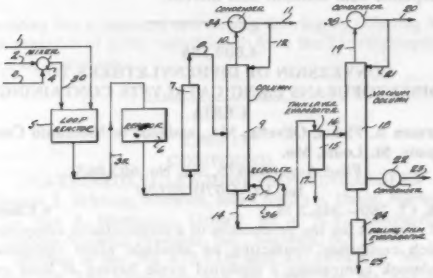
Wolfgang Heim, Bruchkobel; Axel Kleemann, Hanau; Heinz Kolb, Hanau, and Gerd Schreyer, Hanau, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Feb. 19, 1975, Ser. No. 551,015

Claims priority, application Germany, Feb. 25, 1974, 2408948

Int. Cl.² C07D *301/12*; B01D *3/10*, *3/28*

U.S. Cl. 260—348.5 L **3 Claims**



1. In a process for preparing glycide by reacting allyl alcohol with aqueous hydrogen peroxide employing a tungsten compound as a catalyst, (1) distilling off from the reaction mixture produced excess alcohol and the predominate part of the water, then taking the sump mixture from said distillation and (2) distilling it at 110°–220° C. and 5 and 60 torr into a volatile portion which is predominantly glycide, high boiling byproducts and the residual part of the water and a sump portion of glycerine, polyglycerine and catalyst, the improvement comprising taking said volatile portion and immediately after said distillation at 110°–220° C., before the volatile portion has cooled substantially, separating said volatile portion at 5 to 60 torr by distilling off the water in a column having a sump, recovering glycide by drawing it off at a point above the sump of said column and removing the high boiling byproducts from the sump.

4,009,189

BASIC ANTHRAQUINONE DYES, THEIR PRODUCTION AND USE

Emilio Baserga, Zurich, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

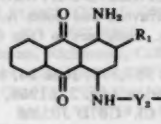
Continuation of Ser. No. 357,114, May 4, 1973, abandoned, which is a continuation of Ser. No. 32,381, April 27, 1970, abandoned. This application June 9, 1975, Ser. No. 584,814

Claims priority, application Switzerland, May 21, 1969, 7690/69; June 6, 1969, 8646/69

Int. Cl.² C07C *97/25*; C09B *1/16*

U.S. Cl. 260—381 **8 Claims**

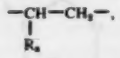
1. A compound of the formula



wherein

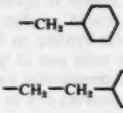
R_1 is chlorine or bromine,

Y_2 is

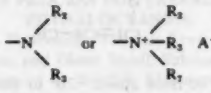


X_1 is the direct linkage or $-CH_2-$, $-C_2H_4-$ or $-OC_2H_4-$,

R_8 is $-CH_3$, $-C_2H_5$, $-C_3H_7$,



Z is



R_2 and R_3 are, independently, alkyl, cyclohexyl, phenyl, or naphthyl,

R_7 is alkyl or phenyl,

A^- is an anion,

and any alkyl group contains 1 to 6 carbon atoms.

4,009,190

BROMOALKYL ALKANESULFONATE

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 293,721, Sept. 29, 1972, abandoned, which is a division of Ser. No. 100,771, Dec. 22, 1970, abandoned. This application Feb. 11, 1974, Ser. No. 441,691

Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 R **6 Claims**

1. A compound corresponding to the generic formula:

$$Br-(CH_2)_n-O-SO_2-R$$

wherein R is selected from the group consisting of iso-butyl, n-butyl and n-hexyl, *n* is 2 or 3.

4,009,191

BROMOETHYL DIESTER OF SULFOACETIC ACID

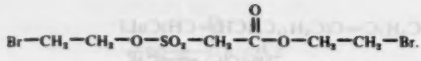
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 441,606, Feb. 11, 1974, abandoned, which is a division of Ser. No. 293,721, Sept. 29, 1972, abandoned, which is a division of Ser. No. 100,771, Dec. 22, 1970, abandoned. This application Oct. 9, 1974, Ser. No. 513,363

Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 R **1 Claim**

1. The compound



4,009,192
O-AMINOSULFONYLGLYCOLIC AMIDES

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, heiress-at-law); Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

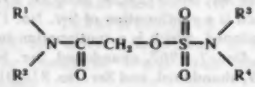
Filed June 16, 1975, Ser. No. 587,355

Claims priority, application Germany, July 1, 1974, 2431582

Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 A **13 Claims**

1. A substituted O-(aminosulfonyl)-glycolic amide of the formula



where R^1 is alkyl of 1 to 8 carbon atoms, alkenyl of 3 to 8 carbon atoms or alkynyl of 3 to 8 carbon atoms, R^2 is alkyl of 1 to 8 carbon atoms or alkenyl of 3 to 8 carbon atoms, R^3 is hydrogen, alkyl of 1 to 8 carbon atoms or halogen alkyl of 1 to 8 carbon atoms and R^4 is hydrogen, alkyl of 1 to 8 carbon atoms or haloalkyl of 1 to 8 carbon atoms.

4,009,193
BISSTYRYLARYL COMPOUNDS

Horst Scheuermann, Ludwigshafen, and Walter Stilz, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

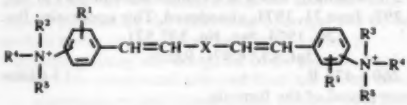
Filed Dec. 12, 1974, Ser. No. 532,192

Claims priority, application Germany, Dec. 22, 1973, 2364396

Int. Cl.² C07C *141/04, 87/68, 121/60*

U.S. Cl. 260—459 A **3 Claims**

1. A compound of the formula



wherein

X is 1,4-phenylene, 1,4-phenylene substituted by chloro, methyl or methoxy or 4,4′-diphenylene,

R^1 is hydrogen, chloro, methyl, methoxy, ethoxy, cyano or methoxycarbonyl,

R^3 and R^4 are alkyl of 1 to 4 carbon atoms, chloro-, methoxy-, β-ethoxy-, β-acetoxy- or β-cyanoethyl, benzyl or phenylethyl,

R^5 is alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 2 to 3 carbon atoms, β-hydroxy-γ-chloropropyl, β-cyanoethyl or alkoxycarbonylethyl of 1 to 4 carbon atoms in the alkoxy, and

A^- is the chloride, bromide, iodide, methosulfate, ethosulfate, benzenesulfonate or p-toluenesulfonate anion where R^5 is said alkyl of 1 to 4 carbon atoms, or A^- is the formate, acetate, propionate or benzoate anion where R^5 is said hydroxyalkyl of 2 to 3 carbon atoms, β-hydroxy-γ-chloropropyl, β-cyanoethyl or alkoxycarbonylethyl of 1 to 4 carbon atoms in the alkoxy.

4,009,194
CATALYTIC AMMOXIDATION OF OLEFINS TO NITRILES

Sumio Umemura; Kyoji Ohdan; Tokuo Matsuzaki; Yasuo Nakamura, and Masao Sawazi, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Apr. 22, 1975, Ser. No. 570,499

Claims priority, application Japan, June 4, 1974, 49-62512

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **5 Claims**

1. A process for producing acrylonitrile or methacrylonitrile by catalytic ammoxidation of propylene or isobutylene, which comprises contacting a feed-gas mixture comprising propylene or isolutylene, ammonia and oxygen in the vapor phase at a temperature of 300° C to 550° C for a period of 0.3 to 20 seconds with a catalyst consisting essentially of as the sole catalyst a predominant amount of oxides each containing two or more metals and a minor amount of simple oxides each containing a single metal, said catalyst having the composition defined by the following formula $Mo_aBiCo_bFe_cZr_dO_e$ wherein each of a, b, c, and d is a positive number indicating an atomic ratio of the respective metal to bismuth and falling within the following ranges, $a = 5.0$ to 15.0, $b = 2.0$ to 8.0, $c = 0.5$ to 4.0 and $d = 0.1$ to 2.0, and e is a positive number falling within the range of 6 to 86 and satisfying the average valency of the respective metals; and said catalyst being the calcined residue of a mixture formed by mixing in an aqueous system the respective metal-containing compounds, said respective metal-containing compounds being in the form of oxide, salt or a mixture thereof.

4,009,195
PROCESSES OF PREPARING OLIGOMERS

Norman A. Leister, Huntingdon Valley, and Richard J. Piccolini, Newtown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

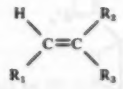
Division of Ser. No. 180,142, Sept. 13, 1971, Pat. No. 3,968,148. This application June 12, 1975, Ser. No. 586,475

Int. Cl.² C07C *67/30*

U.S. Cl. 260—465.4 **4 Claims**

1. An oligomerization process which comprises the continuous and concurrent addition of:

a. from about 1 to about 35 percent by weight of a derivative of acrylic acid having the formula



wherein

R_1 is selected from H, CO_2H or CO_2R_4

R_2 is selected from H or CH_3

R_3 is $(CH_2)_nX_1$

n is an integer ranging from 0 to 8

X_1 is selected from a halogen, CO_2H, CO_2R_5, C ≡ N or

R_4 is an alkyl group having one to four carbon atoms, R_5 is selected from any alkyl group having one to four carbon atoms or a polar moiety containing ether or sulfide or sulfinyl or hydroxyl or amine or amide groups or combinations thereof. containing as many as 12 carbon atoms,

Y is selected from -NZ′Z″ $O(CH_2)_m$-NZ′Z″, $O(CH_2)_m$ C-NZ′Z″, —NHNZ′Z″ or $—N^- N^+ Z_3'''$,

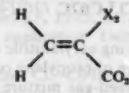
m is an integer from 1 to 12,

Z′ is hydrogen or an alkyl group, straight or branched, of 1 to 20 carbon atoms,

Z″ is hydrogen or an alkyl group of 1 to 20 carbon atoms,

Z''' is an alkyl group of 1 to 4 carbon atoms, and Z' and Z'' can be taken together to form an azacyloalkyl ring, an azacycloalkanone ring, a carbalkoxyazacycloalkanone ring, an oxaazacycloalkanone ring or a diazacycloalkanone ring, and

b. from about 1 to about 45 percent by weight of a derivative of acrylic acid having the formula I



wherein X_2 is selected from hydrogen or a methyl group, and R_8 is a straight or branched, 8 to 34 carbon atom, alkyl group to a mixture of:

c. from about 0.01 to about 10 percent by weight of the materials being polymerized of a free radical initiator, and

d. from about 10 to about 90 percent by weight of at least one straight or branched alkene-1 having four to thirty-two carbon atoms, said addition being carried out as such a rate that the substantially instantaneous mole ratio in the reaction mixture of said acid derivatives to the alkene-1 is maintained relatively constant at from about 0.001 to about 0.20 during said addition, and said addition being carried out at a temperature which will not impair the oligomerization.

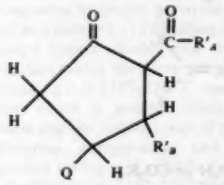
4,009,196

2-ACYL-3-SUBSTITUTED CYCLOPENTAN-1-ONES AND PROCESS FOR THEIR PREPARATION

Seizi Kurozumi, Hino; Takeshi Toru, Hino; Toshio Tanaka, Hino; Shuzi Miura, Hino; Makiko Kobayashi, Hino, and Sachio Ishimoto, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 28, 1975, Ser. No. 554,097
Claims priority, application Japan, Mar. 4, 1974, 49-24133
Int. Cl.² C07C *49/28, 49/30, 69/74*
U.S. Cl. 260—468 D **11 Claims**

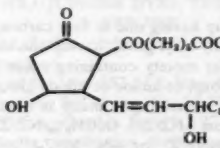
1. 2-Acyl-3-substituted cyclopentan-1-ones of the following formula



(IV-A)

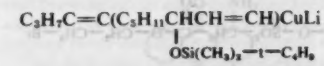
wherein Q is a hydrogen atom, a hydroxyl group or a protected hydroxyl group; R'_A is a monovalent organic group containing 1 to 20 carbon atoms; and R'_B is a monovalent organic group containing 2 to 20 carbon atoms.

5. A process for preparing ethyl ester of 7-oxoprostaglandin E_1 of formula



which comprises

1. reacting 4-t-butyldimethyl-siloxycyclopent-2-ene-1-one with



in the presence of an aprotic inert organic solvent which is a liquid at the reaction temperature,

2. reacting the reaction product from (1) with ω-carboethoxycaproyl chloride in the presence of an aprotic inert solvent which is a liquid at the reaction temperature, and

3. hydrolyzing the reaction product of (2) to form ethyl ester of 7-oxoprostaglandin E_1.

4,009,197

2-(6-SUBSTITUTED-2'-NAPHTHYL) ACETIC ACID DERIVATIVES AND THE SALTS AND ESTERS THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

Continuation of Ser. No. 372,028, June 21, 1973, Pat. No. 3,904,682, which is a continuation of Ser. No. 176,740, Aug. 31, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 694,771, Dec. 7, 1967, abandoned, Ser. No. 810,013, March 24, 1969, abandoned, and Ser. No. 810,014, March 24, 1969, abandoned, said Ser. No. 810,013, and Ser. No. 810,014, each is a continuation-in-part of Ser. No. 694,771, , and Ser. No. 608,997, Jan. 13, 1967, abandoned, said Ser. No. 694,771, is a continuation-in-part of Ser. No. 608,997,. This application May 1, 1975, Ser. No. 573,483
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.² C07G *69/76*
U.S. Cl. 260—473 F **11 Claims**

1. The isoamyl ester of d 2-(6'-methoxy-2'-naphthyl)propionic acid.

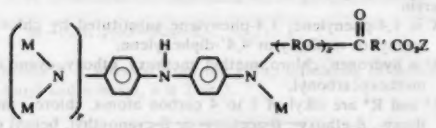
4,009,198

ANTIDEGRADANT ESTERS

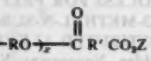
Joseph A. Pawlak, Buffalo, and Francis J. Bajer, Depew, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 508,602, Sept. 23, 1974, abandoned, which is a continuation of Ser. No. 319,101, Dec. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 155,297, June 21, 1971, abandoned. This application Dec. 30, 1974, Ser. No. 537,521
Int. Cl.² C07C *93/26*
U.S. Cl. 260—475 R **13 Claims**

1. A compound of the formula



wherein, X is from 1 to 12; Z is a member selected from the group consisting of —H, —NH_4, alkali metal, lower alkyl and lower hydroxyalkyl; R is a member selected from the group consisting of ethylene, 1,2-propylene, 1,2-butylene, 2,3-butylene, styrylene and mixtures thereof; R' is selected from the group consisting of substituted or unsubstituted arylene moieties derived from an aryl dicarboxylic acid anhydride and in which any substituent is selected from the group consisting of carboxy, halo and lower alkyl substituents; M is a member selected from the group consisting of alkyl and cycloalkyl hydrocarbon of up to 20 carbon atoms, —RO)$_z$ H, and



wherein R, X, R' and Z are as above defined; and *p* is an integer from 0–1, providing when *p* is O,

is hydrogen.

4,009,199
METHOD FOR PREPARATION OF DIMETHYL TEREPHTHALATE

Ferdinand List, and Kurt Wember, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Division of Ser. No. 389,793, Aug. 20, 1973, Pat. No. 3,907,709. This application June 20, 1975, Ser. No. 588,836
Claims priority, application Germany, Sept. 2, 1972, 2243240
Int. Cl.² C07C *69/82*
U.S. Cl. 260—475 R 12 Claims

1. In the method for preparation of dimethyl terephthalate by the esterification of terephthalic acid with methanol in the gas phase in the presence of active, highly abrasion-free and mechanically stable silica gel esterification catalysts prepared from an inorganic oxide gel obtained by forming a hydrosol or inorganic oxide characterized by an inherent capacity to set to a hydrogel upon the lapse of a suitable period of time without addition to or subtraction from said sol of any substance, by admitting said sol in the form of separate globules to a body of a fluid medium substantially immiscible with water in which said globules assume spheroidal shape due to surface tension at the interface between said sol and said fluid medium, said medium being maintained at a temperature below the boiling point of said sol, by retaining said spheroidal globules in said medium until gelation occurs, by retaining in said globules substantially all the constituents of said sol until gelation occurs, by washing the spheroidal hydrogel and by drying the washed hydrogel, the improvement comprising:

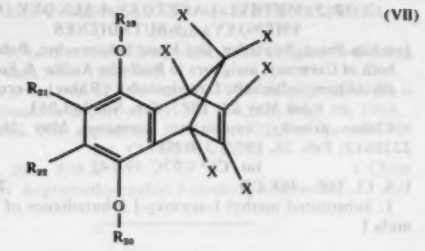
a. impregnating said inorganic oxide gel with a solution of a metallic compound selected from the group consisting of aluminum organic compounds, sodium aluminate, potassium aluminate, titanium organic compounds, zinc organic compounds, and tin organic compounds;
b. removing excess solution; and
c. drying the impregnated inorganic oxide gel to form said active, highly abrasion-free and mechanically stable silica gel esterification catalysts.

4,009,200
HEXAHALO-1,4-DIHYDRO-1,4-METHANO-NAPTH-5,8-YLENE ACETATES

Julian R. Little, Wayne; Walter Nudenberg, West Caldwell, and Yong S. Rim, Paterson, all of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 329,177, Feb. 2, 1973, Pat. No. 3,875,236, which is a division of Ser. No. 80,747, Oct. 14, 1974, abandoned. This application July 8, 1974, Ser. No. 486,482
Int. Cl.² C07C *53/00*
U.S. Cl. 260—479 C 6 Claims

1. A compound having the formula:



(VII)

wherein R_{19} and R_{20} are both

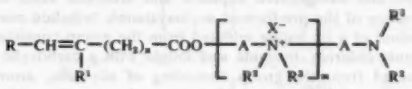
wherein R_{20} is lower alkyl, R_{21} and R_{22} are both hydrogen and X is halogen.

4,009,201
POLYMERIZABLE CATIONIC MONOMERS

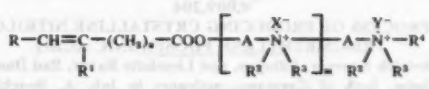
Robert Steckler, Crofton, and Seymour Martin Linder, Baltimore, both of Md., assignors to Alcolac Inc., Baltimore, Md.

Filed May 20, 1974, Ser. No. 471,441
Int. Cl.² C07C *69/54*
U.S. Cl. 260—486 R 16 Claims

1. A polymerizable cationic monomer having the formula:

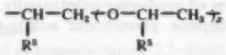


and the quaternized derivatives thereof having the formula:



wherein

A, each of which may be the same or different, represents a divalent alkylene group of from 1 to 20 carbon atoms or a polyglycol ether group of the formula



wherein R^5 represents H, methyl or ethyl and *x* represents an integer of from 1 to 20;

R represents H or methyl;

R^1 represents H or, when R is H, an alkyl group of 1 to 4 carbon atoms;

R^2, R^3 and R^4, each of which may be the same or different, each represents alkyl of from 1 to 20 carbon atoms, phenyl, benzyl or the R^2 and R^3, on the same nitrogen atom, taken together represent a divalent aliphatic group of 4 to 5 atoms which jointly with the amino nitrogen forms a pyrrolidinyl, piperidinyl, morpholino or thiamorpholino heterocyclic amino group;

X and Y, each of which may be the same or different, each represents an anion;

n represents an integer, including 0, of from 0 to 10; and

m represents an integer of from 1 to 5.

4,009,202
2(OR 3)-METHYL-1-ACETOXY-4-ALKOXY (OR PHENOXY)-1,3-BUTADIENES

Joachim Paust, Neuhofen, and Horst Schumacher, Bobenheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

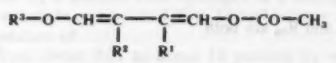
Filed May 25, 1973, Ser. No. 363,861

Claims priority, application Germany, May 26, 1972, 2225612; Feb. 28, 1973, 2309885

Int. Cl.² C07C *69/145*

U.S. Cl. 260—488 CD **7 Claims**

1. Substituted methyl-1-acetoxy-1,3-butadienes of the formula I



(I)

in which R^1 and R^2 are different and denote hydrogen or methyl and R^3 denotes an alkyl radical of from 1 to 4 carbon atoms or phenyl.

4,009,203
CONVERSION OF OLEFINS TO ESTERS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 27, 1975, Ser. No. 544,595

Int. Cl.² C07C *67/04*

U.S. Cl. 260—497 R **10 Claims**

1. A process for the production of an ester which comprises reacting an olefinic hydrocarbon with a carboxylic acid selected from the group consisting of aliphatic, aromatic, alkenic and halogenated aliphatic and aromatic acids in the presence of the pre-formed acyloxystannic trihalide reaction product of a tin halide selected from the group consisting of stannic chloride, bromide and iodide with a carboxylic acid selected from the group consisting of aliphatic, aromatic, alkenic and halogenated aliphatic and aromatic acids, and recovering the resultant ester.

4,009,204
PROCESS OF PRODUCING CRYSTALLINE NITRILO TRIS-(METHYLENE PHOSPHONIC ACID)

Friedrich Krueger, Edingen, and Lieselotte Bauer, Bad Duerkheim, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen am Rhein, Germany

Filed Mar. 18, 1971, Ser. No. 125,852

Claims priority, application Germany, Mar. 20, 1970, 2013372

Int. Cl.² C07F *9/38*

U.S. Cl. 260—502.5 **8 Claims**

1. In a process of producing substantially pure, crystalline nitrilo tris-(methylene phosphonic acid), the steps which comprise

a. slowly adding a phosphorus trihalogenide selected from the group consisting of phosphorus trichloride, phosphorus tribromide, and phosphorus triiodide to an aqueous solution of formaldehyde and a lower aliphatic acid amide selected from the group consisting of formamide and oxamide at room temperature, while stirring, the proportion of formaldehyde to phosphorus trihalogenide to acid amide calculated for one acid amide group being about 3:3:1,

b. slowly increasing the temperature of the resulting reaction mixture to at least the temperature of the boiling water bath,

c. heating the reaction mixture at a temperature between about 100° and about 140° C. to complete reaction,

d. cooling the reaction solution to room temperature, and

e. separating the resulting crystallized nitrilo tris-(methylene phosphonic acid) precipitated from the reaction solution on cooling.

4,009,205
PROCESS FOR PREPARING 4-AMINO-3-METHYL-N-SUBSTITUTED OR UNSUBSTITUTED ALKYLANILINES

Shiro Kimura; Hideo Nagasawa; Yasuo Kato; Yasuyoshi Nakamura; Shoji Miki, and Yumiko Ishikawa, all of Tokyo, Japan, assignors to Sanko Chemical Company Ltd., Tokyo, Japan

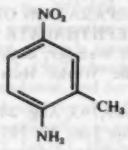
Filed Oct. 10, 1974, Ser. No. 513,787

Claims priority, application Japan, Nov. 14, 1973, 48-127373

Int. Cl.² C07C *143/75, 143/58, 143/64*; G03C *5/30*

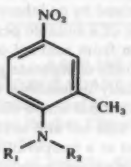
U.S. Cl. 260—556 A **11 Claims**

1. A process for the preparation of 4-amino-3-methyl-N-substituted or unsubstituted alkylanilines comprising acylating or sulfonylating or acylating and difonylating 4-amino-3-methyl-nitrobenzene have the formula (I)



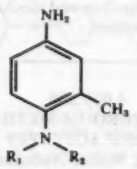
(I)

with an acylation or sulfonylation or acylation and sulfonylation agent to obtain a compound having the general formula (II)



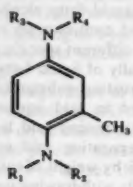
(II)

wherein R_1 represents a hydrogen atom or an acyl group, R_2 represents an acyl group or a sulfonyl group, or R_1 and R_2 can combine as a difunctional acyl group; reducing the nitro group of the compound having the general formula (II) with hydrogen in the presence of a metal hydrogenation catalyst to obtain a compound having the general formula (III)



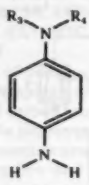
(III)

wherein R_1 and R_2 are as above defined; alkylating the amino group of the compound having the general formula (III) with one or more alkylation steps each using an alkylation agent selected from the group consisting of an alkyl halide, a substituted alkyl halide, an alkyl aldehyde, a dialkyl sulphate and an alkylene oxide to obtain a compound having the general formula (IV)



(IV)

wherein R_1 and R_2 are as above defined, R_3 represents an alkyl group having 1 to 3 carbon atoms or an alkyl group having 2 to 3 carbon atoms and substituted by a hydroxy, a β-methylsulfonamido as a SO_3H group and R_4 represents a hydrogen atom, an alkyl group having 1 to 3 carbon atoms or an alkyl group having 2 to 3 carbon atoms substituted by a hydroxy group; hydrolyzing the compound having the general formula (IV) to obtain a compound having the general formula (V)



(V)

wherein R_3 and R_4 are as above defined.

4,009,206

N-(SUBSTITUTED PHENYL AND BENZYL)ABIETAMIDES

Hiromu Murai; Katsuya Ohata; Hiroshi Enomoto; Kenji Sempuku; Koji Kitaguchi; Yukio Fujita; Yoshiaki Yoshikuni; Kohei Kura; Katsahide Saito; Tamiki Mori, and Yasuo Yasutomi, all c/o Nippon Shinyaku Co., Ltd., 14 Kisshoin Nishinosho Monguchicho, Minami Kyoto, Japan

Filed Aug. 13, 1975, Ser. No. 604,308

Claims priority, application Japan, Aug. 28, 1974, 49-99386; Nov. 9, 1974, 49-129295

Int. Cl.² C07C *101/18, 101/453, 103/19;* **A61K** *31/16*

U.S. Cl. 260—557 B **15 Claims**

1. An N-(substituted phenyl) or N-(substituted benzylamide of an acid selected from the group consisting of abietic, dehydroabietic, dihydroabietic and tetrahydroabietic acids wherein said phenyl or benzyl is substituted with from one to three substituents independently selected from the group consisting of halo, nitro, lower alkyl, haloalkyl, hydroxyl, lower alkoxy, carboxyl or carbalkoxy.

4,009,207

CARBAMOYLALKYL SUBSTITUTED POLY(PHOSPHINE OXIDE) FLAME-RETARDANTS

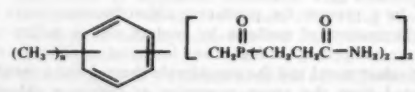
Joseph Adrian Hoffman, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 603,463, Aug. 11, 1975, Pat. No. 3,976,685. This application Apr. 15, 1976, Ser. No. 677,338

Int. Cl.² C07C *103/75*

U.S. Cl. 260—558 A **5 Claims**

1. A compound having the formula



wherein *n* is a whole, positive integer of 1–4, inclusive.

4,009,208

N,N′-HEPTAMETHYLENEBIS(4-METHOXYBENZAMIDE)

George Y. Lesher, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 62,186, Aug. 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 756,373, Aug. 30, 1968, abandoned. This application Nov. 21, 1972, Ser. No. 308,498

Int. Cl.² C07C *103/82*

U.S. Cl. 260—559 R **1 Claim**

1. N,N′-heptamethylenebis(4-methoxybenzamide).

4,009,209

DIMERIZATION OF CYCLOHEXYLIDENE-ACETONITRILE AND HYDROGENATION OF THE RESULTING SUBSTITUTED GLUTARIC ACID DINITRILE

Ernst Ingo Leupold, Hofheim, Taunus, and Hans-Jürgen Arpe, Fischbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

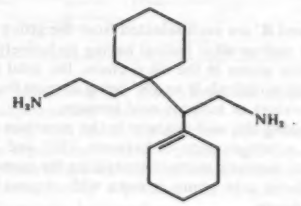
Division of Ser. No. 567,053, April 11, 1975, which is a continuation-in-part of Ser. No. 460,152, April 11, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,706

Claims priority, application Germany, Apr. 13, 1973, 2318676

Int. Cl.² C07C *87/34*

U.S. Cl. 260—563 P **9 Claims**

1. 1,5-diamino-2-(1-cyclohexenyl)-3,3-pentamethylenepentane of the formula



4,009,210

PROCESS FOR MANUFACTURING 3,5-DITERT.BUTYL-4-HYDROXYBENZALDEHYDE BY FORMYLATION OF 2,6-DITERT.BUTYLPHENOL

Roger P. Cahoy, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 7, 1975, Ser. No. 575,555

Int. Cl.² C07C *45/00*

U.S. Cl. 260—600 R **3 Claims**

1. The method of manufacturing 3,5-ditert.butyl-4-hydroxybenzaldehyde comprising reacting a mixture consisting of 2,6-ditert.butylphenol with 2 to 3 molar equivalents of hexamethylenetetramine in at least 80 volume percent aqueous acetic acid at reflux temperature under atmospheric pressure.

4,009,211

BETA,BETA-DIALKYLETHYLMERCAPTOETHOXYLATE AS NEW COMPOUNDS

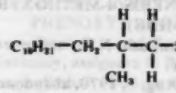
Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 29, 1975, Ser. No. 600,150

Int. Cl.² C07C *149/18*

U.S. Cl. 260—609 R **2 Claims**

1. Novel beta,beta-dialkylethylmercaptoethoxylates of the following structural formula:



wherein *n* is an integer from 8 to 16.

4,009,212
METHOD FOR THE PREPARATION OF META DIHYDROXYBENZENES

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

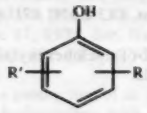
Continuation-in-part of Ser. No. 334,270, Feb. 21, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,767

Int. Cl.² C07C *37/04*

U.S. Cl. 260—628 **5 Claims**

1. A process for the preparation of dihydroxybenzenes wherein the hydroxyl radicals are in meta position to each other, the said process comprising:

A. heating in the presence of sulfuric acid and at a temperature between 25° and 120° C. a hydroxybenzene having the formula



in which R and R′ are each selected from the group consisting of hydrogen and an alkyl radical having inclusively from one to four carbon atoms in the alkyl chain, the total number of carbon atoms in radicals R and R′ being at most four, thereby forming a mixture of sulfonic acid isomers;

B. isomerizing the said mixture in the presence of sulfuric acid at a temperature of between 130° and 200° C to obtain an isomeric mixture containing the isomer wherein the sulfonic acid group is meta with respect to the hydroxyl group;

C. selectively hydrolyzing in an aqueous medium at a temperature between about 100° and 150° C. in the said mixture those sulfonic acid isomers in which the sulfonic acid group is in a position other than meta with respect to the hydroxyl group to produce thereby the selected hydroxybenzene of step A;

D. caustically fusing the unhydrolyzed meta sulfonic acid remaining in the aqueous medium; and

E. acidifying the resultant salt of the meta dihydroxybenzene to liberate the desired meta dihydroxybenzene.

4,009,213
CONTINUOUS PROCESS FOR THE SEPARATION OF MIXTURES OF FATTY SUBSTANCES OF DIFFERENT MELTING POINTS

Werner Stein, Erkrath-Unterbach, and Helmut Hartmann, Langenfeld, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

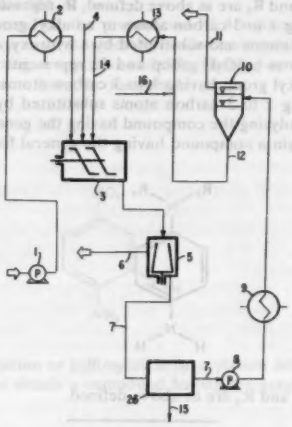
Continuation-in-part of Ser. No. 521,915, Nov. 7, 1974, Pat. No. 3,953,485, which is a division of Ser. No. 300,895, Oct. 26, 1972, Pat. No. 3,870,735. This application Mar. 9, 1976, Ser. No. 600,215

Claims priority, application Germany, Nov. 11, 1971, 2155988

Int. Cl.² C07C *29/24*

U.S. Cl. 260—643 D **8 Claims**

1. A continuous process for the separation of mixtures of fatty alcohols into fatty alcohol mixtures of different melting points by the steps of continuously dispersing said mixture of fatty alcohols consisting of an oily phase and a solid phase in a recycling aqueous wetting agent solution at a temperature whereby a dispersion of liquid fatty alcohol and solid fatty alcohol particles is obtained, continuously separating said dispersion into two phases of different specific gravities, a lighter phase consisting substantially of liquid fatty alcohol fractions and a heavier phase consisting substantially of solid fatty alcohol particles dispersed in said aqueous wetting agent solution, continuously withdrawing said liquid fatty alcohol fractions, continuously separating said solid fatty alcohol particles from 10% to 70% by weight of said aqueous wetting agent solution, continuously withdrawing said separated aqueous wetting agent solution, continuously melting said solid fatty alcohol particles with the remaining aqueous phase and adhering wetting agent, in an aqueous phase, continuously separating said melted fatty alcohol particles containing little wetting agent from an aqueous phase enriched with wetting agent, continuously withdrawing said melted fatty alcohol particle, continuously recycling said aqueous phase enriched with wetting agent to said dispersing step and continuously replacing said withdrawn part of said recycling aqueous wetting agent solution with a fresh aqueous solution whereby the concentration of said recycling aqueous wetting agent solution is maintained substantially constant at said dispersing step.



4,009,214
SEPARATION OF HYDROGEN FLUORIDE FROM HYDROGEN CHLORIDE GAS

Morgan C. Sze, Upper Montclair, and John E. Paustian, Whippany, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Apr. 25, 1975, Ser. No. 571,805

Int. Cl.² C07C *17/15*, *17/38*, *7/08*, *7/22*

U.S. Cl. 260—653.7 **8 Claims**

1. A process for separating an impurity from hydrogen chloride gas containing at least one member selected from the group consisting of hydrogen fluoride and silicon tetrafluoride, comprising:

contacting at a temperature of from 0° to 90° C said hydrogen chloride gas with calcium chloride supported on activated alumina in an amount of from 1 to 30 weight percent based on activated alumina and calcium chloride to reduce the content of said at least one member to less than 50 ppm.

8. In a process for producing chlorofluoromethanes by oxychlorination of methane by contact with a molten salt mixture comprising the higher and lower valent chlorides of a multivalent metal and the oxychloride thereof and a member selected from the group consisting of hydrogen chloride, chlorine and mixture thereof to produce chlorinated methanes, contacting chlorinated methane with hydrogen fluoride

to produce chlorofluoromethanes and hydrogen chloride and recovering hydrogen chloride containing an impurity selected from the group consisting of hydrogen fluoride and a mixture of hydrogen fluoride and silicon tetrafluoride, the improvement comprising:

contacting at a temperature of from 0° to 90° C the hydrogen chloride containing said impurity with calcium chloride supported on activated alumina in an amount of from 1 to 30 weight percent based on activated alumina and calcium chloride to reduce the content of the impurity to less than 50 ppm; and

employing said hydrogen chloride having less than 50 ppm of said impurity in said oxychlorination of methane.

4,009,215
PREPARATION OF CCl_3F AND CCl_2F_2 FROM FLUORSPAR AND CCl_4

Edmund Odon Banas, Brackenville Road R.D. No. 1, P.O. Box 327, Hockessin, Del. 19707, and Wesley Gerald Schindel, Valley Court Apts., Apt. D-7, Pennsville, N.J. 08070

Filed Mar. 16, 1976, Ser. No. 667,372

Int. Cl.² C07C *17/10, 19/08*

U.S. Cl. 260—653.8 **5 Claims**

1. In the process of bringing into contact, under reaction conditions and at a temperature of about from 300° to 650° C, calcium fluoride and carbon tetrachloride to form a mixture of CCl_3F and CCl_2F_2, the improvement which comprises contacting the reactants countercurrently in at least on reaction vessel with axial plug flow and radial shear mixing.

4,009,216
PREPARATION OF ISOPROPYL CHLORIDE

Johann Grolig, Leverkusen; Manfred Martin, Cologne, and Gerhard Scharfe, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 418,142, Nov. 21, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,641

Claims priority, application Germany, Dec. 9, 1972, 2260336

Int. Cl.² C07C *17/08*

U.S. Cl. 260—663 **6 Claims**

1. In the preparation of isopropyl chloride wherein propylene and hydrogen chloride are reacted at elevated temperature in the gaseous phase in the presence of aluminum oxide as catalyst, the improvement which comprises effecting the reaction at a pressure of about 3 to 8 atm, at a temperature of about 50° to 200° C, and in the presence of aluminum oxide having an internal surface area of about 200 to 500 m^2/g.

4,009,217
PROCESS FOR PRODUCTION AND DEHYDROGENATION OF ETHYLBENZENE

Kenneth D. Uitti, Bensenville, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,985

Int. Cl.² C07C *15/00, 15/10*

U.S. Cl. 260—669 R **4 Claims**

1. A combination process for the manufacture of an alkenylaromatic hydrocarbon by the alkylation of benzene with an olefinic compound and the subsequent catalytic dehydrogenation of a resultant alkylaromatic hydrocarbon, which comprises:

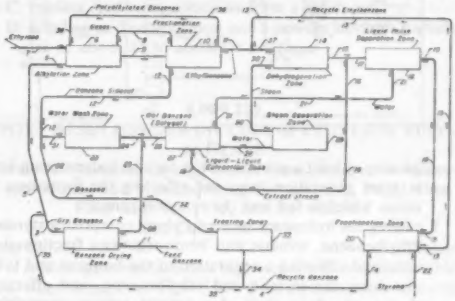
a. passing a feed stream comprising benzene, the olefinic compound and a boron trifluoride into an alkylation zone maintained at alkylation conditions and effecting the formation of a first effluent stream comprising benzene, the alkylaromatic hydrocarbon and a polyalkylated aromatic hydrocarbon;

b. separating the first effluent stream in a first fractionation zone and effecting the formation of a first distillate stream comprising the alkylaromatic hydrocarbon and a second distillate stream comprising benzene and a volatile complex formed by admixing a boron trifluoride stream charged to the first fractionation zone with boron oxide hydrates contained in the first effluent stream;

c. passing at least a portion of the second distillate stream into a water wash zone and effecting the removal of the volatile complex from the second distillate stream by contact with water and the formation of a solvent stream comprising benzene and dissolved water;

d. admixing the first distillate stream with superheated steam and passing a resultant admixture into a dehydrogenation zone maintained at dehydrogenation conditions including the presence of a fixed bed heterogeneous dehydrogenation catalyst, and effecting the formation of a second effluent stream comprising the alkenylaromatic hydrocarbon;

e. condensing hydrocarbons in the second effluent stream having more than five carbon atoms per molecule, and then passing the second effluent stream into a liquid phase separation zone and separating the second effluent stream into an aqueous phase and a liquid hydrocarbon



phase comprising the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon;

f. removing said liquid hydrocarbon phase from the liquid phase separation zone and passing said liquid hydrocarbon phase into a second fractionation zone, and effecting the formation of a product stream comprising the alkenylaromatic hydrocarbon;

g. removing said aqueous phase comprising the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon from the liquid phase separation zone and contacting said aqueous phase with said solvent stream in a liquid-liquid extraction zone, and effecting the transfer of at least a portion of the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon in the aqueous phase to said solvent stream and the formation of an extract stream comprising benzene, dissolved water, the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon; and,

h. admixing the extract stream with the second effluent stream.

4,009,218
ALKYLAROMATIC HYDROCARBON DEHYDROGENATION PROCESS

Kenneth D. Uitti, Bensenville, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,986

Int. Cl.² C07C *15/00, 15/10*

U.S. Cl. 260—669 R **3 Claims**

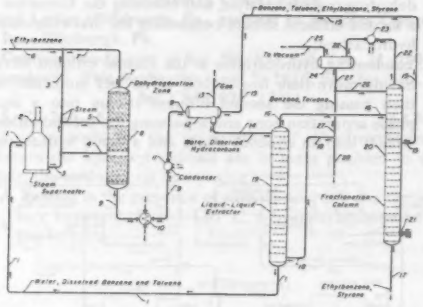
1. A process for the dehydrogenation of ethylbenzene which comprises in cooperative combination the steps of:

a. admixing a feed stream comprising ethylbenzene with steam and contacting the resulting admixture with a heterogeneous fixed-bed dehydrogenation catalyst within a reaction zone maintained at dehydrogenation conditions and effecting the formation of an effluent stream comprising styrene, ethylbenzene and steam;

b. effecting a partial condensation of the effluent stream by passage through a condensing zone;

c. passing the effluent stream into a phase separation zone and effecting the formation of a hydrocarbonaceous phase comprising styrene, ethylbenzene, toluene and benzene and an aqueous phase comprising styrene;

d. passing a first water stream comprising at least a portion of the aqueous phase into a liquid-liquid extraction zone and effecting a removal of substantially all of the styrene from the first water stream by contact with a solvent stream comprising benzene, and effecting the formation of a second water stream which is substantially free of styrene;



e. passing at least a portion of the second water stream into a steam generation zone and effecting the formation of steam which is fed into the reaction zone;

f. passing the hydrocarbonaceous phase comprising styrene, ethylbenzene, toluene and benzene into a fractionation zone and effecting a separation of the benzene and toluene from the styrene and ethylbenzene, and effecting therein the formation of a solvent stream comprising benzene which is substantially free of styrene and ethylbenzene; and,

g. passing at least a portion of the solvent stream comprising benzene into the liquid-liquid extraction zone as the solvent stream.

4,009,219

TOTAL SYNTHESIS OF BENZENE FROM NON-HYDROCARBON MATERIALS

Murry A. Tamers, Nova University College Ave., Fort Lauderdale, Fla. 33314

Filed Apr. 28, 1975, Ser. No. 572,165
Int. Cl.² C07C *3/02, 11/24*
U.S. Cl. 260—673 **10 Claims**

1. The process of producing benzene comprising:

a. reacting non-hydrocarbon carbonaceous material in a sealed, substantially leak-free reactor with lithium in the form of lithium metal, lithium hydroxide or lithium oxide at a temperature of at least 500° C in the strict absence of air and moisture to produce lithium carbide;

b. hydrolyzing said lithium carbide to produce acetylene and lithium in at least one of said forms;

c. cyclizing said acetylene to produce benzene;

d. and recycling through step (a) said lithium produced in step (b).

4,009,220

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Mar. 24, 1976, Ser. No. 670,015
Int. Cl.² C07C *3/04;* **B01V** *23/62*
U.S. Cl. 260—673.5 **27 Claims**

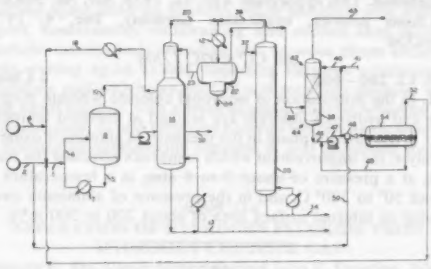
1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,009,221

HF RECOVERY WITH ALKYL FLUORIDE FORMATION AND UTILITY IN ALKYLATION

Cecil O. Carter, Wann, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 327,734, Jan. 29, 1973, Pat. No. 3,906,051. This application June 19, 1975, Ser. No. 588,558
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **3 Claims**



1. A process for the production of an alkylate comprising:

a. introducing an isoparaffin selected from the group consisting of isobutane, isopentane and mixtures thereof and an olefin selected from the group consisting of propylene, butylene, isobutylene, amylenes and mixtures thereof and an HF catalyst into an alkylation reaction zone,

b. reacting the materials introduced into said alkylation reaction zone to form an effluent comprising an alkylate,

c. separating said effluent into an HF catalyst phase and a hydrocarbon phase,

d. passing said hydrocarbon phase into a fractionation zone,

e. withdrawing said alkylate from said fractionation zone as a liquid,

f. withdrawing a vapor comprising light hydrocarbons and HF from said fractionation zone,

g. contacting said vapor from said fractionation zone with water to form a vapor stream of light hydrocarbons substantially free of HF and a stream of a liquid first mixture comprising HF and water,

h. reacting said stream of a liquid first mixture with an olefin selected from the group consisting of propylene, isobutyl-

ene, cis-butene-2, trans-butene-2, butene-1, amylenes and mixtures thereof to form an alkyl fluoride comprising reaction product,

i. separating said alkyl fluoride from said reaction product, and

j. introducing said alkyl fluoride into the alkylation reaction zone.

4,009,222

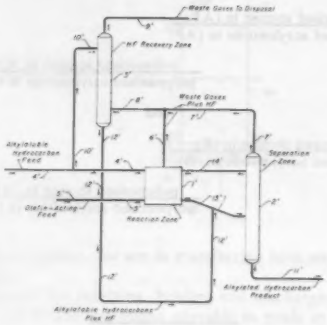
RECOVERY OF GASEOUS HYDROGEN FLUORIDE STREAM IN ALKYLATION PROCESS

Michael Z. Mikulicz, Palatine; William G. Boney, Rolling Meadows, and Bipin V. Vora, Buffalo Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 520,811, Nov. 4, 1974, Pat. No. 3,957,902. This application Oct. 22, 1975, Ser. No. 624,626

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.48 **2 Claims**



1. An alkylation process which comprises the steps of:

a. reacting an olefin with an alkylatable hydrocarbon in contact with hydrogen fluoride catalyst in a reaction zone;

b. passing the resultant HF and hydrocarbons from said reaction zone to a fractionation zone;

c. fractionating said HF-containing hydrocarbons in said fractionation zone to separate a stream of gaseous hydrogen fluoride from said hydrocarbons therein;

d. removing a stream of alkylated hydrocarbon product from said fractionation zone;

e. separating a stream of admixed unreacted alkylatable hydrocarbon and hydrogen fluoride from said fractionation zone and supplying said stream to said reaction zone;

f. passing said gaseous hydrogen fluoride stream from said fractionation zone to an absorption zone;

g. passing at least a portion of said alkylatable hydrocarbon to said absorption zone and therein contacting the same with said gaseous hydrogen fluoride stream to absorb hydrogen fluoride into said alkylatable hydrocarbon; and

h. passing said alkylatable hydrocarbon containing absorbed hydrogen fluoride from said absorption zone to said fractionation zone.

4,009,223

THIN FILM ELECTROSTATIC EPOXY COATING POWDER

Charles M. Noonan, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,336

Int. Cl.² C08L *63/00*

U.S. Cl. 260—830 TW **23 Claims**

1. A coating powder made by

A. dry mixing a composition which comprises:

1. a first diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C;

2. a second diglycidyl ether of bisphenol A having an E.E.W. of about 750 to about 1400 and a melting point of about 100° to about 130° C, where said second diglycidyl ether is different from said first diglycidyl ether and the weight ratio of said first diglycidyl ether to said second diglycidyl ether is about 1 to 1 to about 12 to 1;

3. about 10 to about 60% by weight based on the weight of the total composition of an epoxy ester, the epoxy portion of said ester being derived from a diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C, and the ester portion being derived from a dibasic acid having the formula $HOOC-(CH_2)_m-COOH$, where m is about 18 to about 54; and

4. about 2 to about 8 phr of a curing agent for said diglycidyl ethers;

B. extruding said composition;

C. cooling said composition to form a solid; and

D. grinding said composition into a powder having a particle size of about 15 to about 74 microns.

4,009,224

EPOXY RESIN POWDER INCLUDING ETHYLENE VINYL ACETATE

Gerald H. Warnken, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 11, 1975, Ser. No. 603,702

Int. Cl.² C08G *45/04*

U.S. Cl. 260—837 R **6 Claims**

1. A homogeneous free-flowing powder which is shelf-stable and when heated to 185°–250° C in contact with a metal article fuses and then gels to provide a tough protective coating, said powder comprising

a polyglycidyl ether of a polyhydric phenol having a softening point of 70°–150° C,

a normally solid latent hardening agent for epoxy resin,

a latent catalyst for accelerating reaction between the polyglycidyl ether and the hardening agent when melted together,

which powder is characterized by the feature that it incorporates per 100 parts of the polyglycidyl ether 3–30 parts by weight of one or more copolymers of monomers comprising by weight 2–50% vinyl acetate and 5–75% ethylene, which copolymer or copolymers have a melt index or combined melt index of 5–400 and impart extraordinarily good flexibility to cured coatings of the powder without undue effect upon other properties of the coatings.

4,009,225

LOW PROFILE PIGMENTED SHEET MOLDING PROCESS AND PRODUCT

John M. Maxel, St. Charles, Ill., assignor to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 403,935, Oct. 5, 1973, abandoned. This application July 10, 1975, Ser. No. 594,651

Int. Cl.² B29C *1/04*; C08F *43/08*

U.S. Cl. 260—862 **8 Claims**

1. A process of preparing a low profile uniformly pigmented sheet molding which comprises preparing a mixture of an unsaturated cross linkable polyester of a dicarboxy acid and a dihydric alcohol, a chemically inert powdered filler, a thermoplastic polymer, a cross linking monomer capable of cross linking with said polyester to produce a thermosetting resin, a tertiary butyl perbenzoate catalyst for the cross linking reaction, a para-benzoquinone high temperature inhibitor for the cross linking reaction, a mold release compound and a pigment, the amount of filler being sufficient to prevent phase separation of the polymer, thereafter adding a thickening

reactant to said mixture, stirring the resultant mixture until thickening occurs but said mixture is still pourable, forming said mixture into a thick layer on a strippable carrier sheet, adding cut bundles of glass filaments to the top of said layer, superimposing a second strippable carrier sheet over the top of said layer, and kneading said layer between said strippable sheets to cause said cut bundles of glass filaments to be distributed uniformly in the interior of said layer, stripping said strippable sheets from said layer, cutting said layer into segments of a size suitable for molding a predetermined article, placing said segments in a mold between solid smooth heated male and female dies which are three-dimensional, and molding said article between said dies at temperatures sufficiently high to cause cross linking to occur between said polyester and said cross linking monomer, the amount of said catalyst being substantially larger than conventionally used for catalyzing said cross linking reaction and being at least about 1.5% by weight of the total resin-forming components and the amount of said inhibitor being at least 300 parts per million by weight of the total resin-forming components and being sufficient to hold back the cross linking reaction until the pigmented sheet, after removal of said strippable sheets, is placed in a mold and allowed to fill the mold.

4,009,226

ABS MOULDING COMPOSITIONS

Karl-Heinz Ott; Gert Humme, both of Leverkusen; Dietmar Kranz, Cologne, and Harry Rohr, Gross Koenigsdorf, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 22, 1975, Ser. No. 570,350

Claims priority, application Germany, Apr. 26, 1974, 2420358

Int. Cl.² C08L *55/02*

U.S. Cl. 260—876 R **6 Claims**

1. A moulding composition comprising:

A. 6 to 30 parts, by weight, of a graft polymer of from 20 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 on from 80 to 40 parts, by weight, of a butadiene homo- or copolymer having a butadiene content of at least 30%, an average particle diameter of from 0.26 to 0.65 μ and a grafting degree of from 0.15 to 0.7;

B. 14 to 45 parts, by weight, of a graft polymer of from 40 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 on from 60 to 40 parts, by weight, of a butadiene homo- or copolymer having a butadiene content of at least 30%, an average particle diameter of from 0.05 to 0.25 μ and a grafting degree of from 0.4 to 0.9; and

C. 25 to 80 parts, by weight, of a copolymer of styrene and/or α-methyl styrene with acrylonitrile in a weight ratio of from 80 : 20 to 60 : 40 having an average molecular weight of from 50,000 to 200,000 and a molecular heterogeneity of from 4.5 to 1.0

4,009,227

ABS MOULDING COMPOSITIONS

Karl-Heinz Ott, Leverkusen; Harry Rohr, Gross Koenigsdorf; Gert Humme, Leverkusen, and Leo Morbitzer, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 22, 1975, Ser. No. 570,996

Claims priority, application Germany, Apr. 26, 1974, 2420357

Int. Cl.² C08L *55/02*

U.S. Cl. 260—876 R **8 Claims**

1. A moulding composition comprising:

A. 5 to 70 parts, by weight of a graft polymer of from 20 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 on from 80 to 40 parts, by weight, of a butadiene homo- or copolymer having a butadiene content of at least 30%, an average particle diameter of from 0.26 to 0.65 μ and a grafting degree of from 0.15 to 0.7;

B. 0 to 50 parts, by weight, of a graft polymer obtained by polymerising from 40 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 onto from 60 to 40 parts, by weight, of a butadiene homo- or co-polymer having a butadiene content of at least 30%, and average particle diameter of from 0.05 to 0.25 μ and a grafting degree of from 0.4 to 0.9; and

C. 25 to 95 parts, by weight of a copolymer of styrene and/or α-methyl styrene with acrylonitrile in a weight ratio of from 80 : 20 to 60 : 40 having an average molecular weight of from 50,000 to 200,000 and a molecular heterogeneity of from 4.5 to 1.0; such that

D. the ratios, by weight, of styrene (including α-methyl styrene, if present) to acrylonitrile satisfy the following conditions:

$$\frac{\text{polymerised styrene in (A)}}{\text{polymerised acrylonitrile in (A)}} : \frac{\text{polymerised styrene in (C)}}{\text{polymerised acrylonitrile in (C)}} > 1$$

and

$$\frac{\text{polymerised styrene in (B)}}{\text{polymerised acrylonitrile in (B)}} : \frac{\text{polymerised styrene in (A)}}{\text{polymerised acrylonitrile in (A)}} < 1$$

4,009,228

PRIMARY AMINE-MODIFIED ANHYDRIDE RESIN

James J. Tazuma, Stow, and Joel Muse, Medina, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 12, 1975, Ser. No. 576,409

Int. Cl.² C08L *23/36*

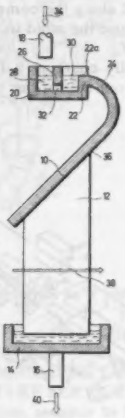
U.S. Cl. 260—878 R **13 Claims**

1. The resinous composition prepared by the method which comprises reacting (A) about 1 to about 2 amine equivalents of a primary amine selected from at least one of the group consisting of aliphatic and aromatic amines and diamines with, correspondingly, (B) about 2 to about 1 equivalents of a maleic anhydride-modified piperylene/methyl branched monoolefin backboned resin at a temperature in the range of about 25° to about 350° C where said anhydride-modified resin is prepared by the method which comprises the steps of (1) reacting about 30 to about 60 parts by weight maleic anhydride, or reacting about 10 to about 25 parts by weight maleic anhydride if an organoperoxide catalyst is used, at a temperature in the range of about 150° to about 250° C with 100 parts by weight of a hydrocarbon-derived resin having a softening point in the range of about 10° to about 50° C prepared by polymerizing in the presence of a catalyst selected from boron trifluoride and boron trifluoride etherate, a monomer mixture which comprises about 40 to about 70 weight percent piperylene, and correspondingly, about 60 to about 30 weight percent of at least one monoolefin selected from methyl branched chain α or β monoolefins containing 4 to 6 carbon atoms, where the weight ratio of piperylene to said branched chain monoolefin is about 0.8/1 to about 2.0/1 and (2) removing unreacted maleic anhydride, if any, preferably by distillation.

4,009,229
APPARATUS FOR HEAT- AND MASS TRANSFER BETWEEN LIQUIDS AND GASES

László Szücs; Csaba Tasnádi, and István Lindner, all of Budapest, Hungary, assignors to Patentbureau Danubia, Budapest, Hungary

Continuation of Ser. No. 435,985, Jan. 23, 1974, abandoned. This application July 31, 1975, Ser. No. 600,650
Int. Cl.² F28C 1/00
U.S. Cl. 261—72 R 7 Claims



1. In an apparatus, for use in transferring heat and mass, in combination

a receptacle for receiving, holding and discharging liquid,

a pile lock in said receptacle operable to guide in film form liquid discharged from said receptacle,

distributing means defining a liquid film distributor surface having a first curved portion and extending from said pile lock, and a second portion extending from said first portion and facing downwards,

an outlet means, and

liquid withdrawing means extending below said second portion and being operable for withdrawing liquid from said second portion and discharging it into said outlet means,

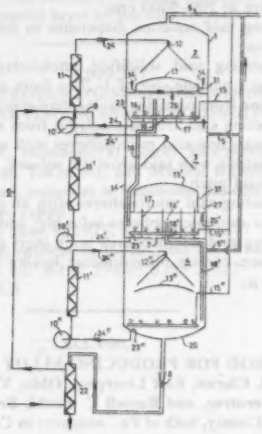
said distributing means being connected to said pile lock and establishing an uninterrupted guide for said liquid film extending from said receptacle to said liquid withdrawing means.

4,009,230
DEVICE FOR VACUUM TREATMENT OF LIQUIDS BY MEANS OF A GASEOUS STRIP-MEDIUM

Johannes Jacobus Smorenburg, Abcoude, Netherlands, assignor to Stark Amsterdam NV, Netherlands

Division of Ser. No. 258,574, June 1, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,495
Claims priority, application Netherlands, June 1, 1971, 7107525
Int. Cl.² B01D 3/10, 3/26
U.S. Cl. 261—148 2 Claims

1. A device for treating liquids with a gaseous stripping fluid, for deodorizing oils and fats, comprising a column having at least two vertically arranged non-packed sections, each section being provided with a vacuum line connected to a vacuum source, a supply line for stripping fluid opening into each section in the vicinity of the bottom, a liquid supply line for spraying the liquid into the upper part of a section, a discharge line for purified liquid, at least one of said sections being provided with a recycling line having pumping means in said recycling line, said recycling line opening into the upper part of said section into a liquid spraying member, overflow means for passing liquid oil from an upper section to a lower section, the bottom of at least one section being provided with



partition means and delivering means for delivering the collected sprayed oil particles at a distance from the opening of the overflow means to prevent passing of oil immediately to the next section through the overflow means.

4,009,231
POWDER BARRIER BONDING TECHNIQUE

Bernard Wasserman, and William H. Thielbahr, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,077
Int. Cl.² C06B 21/00
U.S. Cl. 264—3 R 6 Claims

1. In a method for loading a rocket motor which comprises casting and curing a solid propellant within a combustion chamber which is lined with a layer of cured silicone rubber insulator material, the improvement residing in casting and curing a barrier layer on said layer of insulator material before casting and curing the propellant grain to prevent materials in the propellant grain from migrating into the insulator layer as the propellant grain cures.

4,009,232
METHOD FOR THE PRODUCTION OF CARBON MICROSPHERES 1–20 μ IN DIAMETER

Zenya Shiiki; Masaaki Nakao, and Kunihiko Katori, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Mar. 12, 1974, Ser. No. 450,397
Claims priority, application Japan, Mar. 13, 1973, 48-28577
Int. Cl.² B01J 2/06
U.S. Cl. 264—9 13 Claims

1. A method for the production of discrete carbon microspheres having a particle size of 1–20 μ comprising:

a. mixing a pitch having a softening point of 70°–250° C, a nitrobenzene-insoluble content of not more than 25% and a H/C ratio of 0.2–1.0 with a water-insoluble aromatic solvent having a boiling point of 70°–250° C to produce a homogeneous pitch/solvent mixture of more than 50% by weight pitch, said mixing being conducted at a temperature of 100°–200° C to maintain a viscosity of 200–5000 cps;

b. dispersing said pitch/solvent mixture with agitation in an

aqueous solution of a surface active agent to form an aqueous dispersion of said pitch/solvent mixture in the form of microspheres, said solution being at a temperature sufficient to retain said viscosity of said pitch/solvent mixture at 200–5000 cps;

c. cooling said aqueous dispersion to solidify said microspheres;

d. separating said solidified pitch/solvent microspheres having a particle size of 1–20 μ from said aqueous solution and from particles having diameters smaller than 1 μ;

e. extracting said aromatic solvent from said microspheres by contacting said microspheres with an organic solvent compatible with said aromatic solvent, but incompatible with said pitch;

f. contacting said microspheres with an oxidizing agent to render said microspheres infusible; and

g. heating said microspheres in an inert gas atmosphere to produce carbon microspheres having a particle size of 1–20 μ.

4,009,233

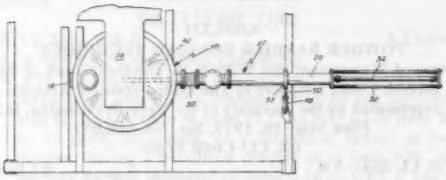
METHOD FOR PRODUCING ALLOY PARTICLES

Thomas S. Cloran, East Liverpool, Ohio; Vernon R. Thompson, Greentree, and Russell C. Buehl, Brighton Township, Beaver County, both of Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 473,110, May 24, 1974, abandoned. This application Apr. 27, 1976, Ser. No. 680,645

Int. Cl.² B01J *2/02*

U.S. Cl. 264—10 **3 Claims**



1. A method of producing particles from reactive metal and reactive metal alloy article, comprising:

a. hydriding at least a surface portion of a reactive metal article under conditions to form a metal hydride therein, said hydrided portion of said article having a hydrogen content of at least 0.05%,

b. heating said article in an inert atmosphere to a temperature and rate of heating in a localized area thereof to locally melt said hydrided portion of said article and to liberate hydrogen gas from said hydride therein, said gas liberation causing immediate atomization of said melt into droplets thereof,

c. cooling said droplets at a rate sufficient to form discrete particles thereof while protected from oxidation and contamination, and

d. collecting said particles.

4,009,234

METHOD FOR HIGH SPEED SINTER MOLDING

Paul M. Erlandson, Palos Park, and Richard R. Szatkowski, Western Springs, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 335,274, Feb. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 73,936, Sept. 21, 1970, abandoned, which is a division of Ser. No. 790,283, Jan. 10, 1969, Pat. No. 3,570,055. This application Sept. 15, 1975, Ser. No. 613,377

Int. Cl.² B29D *23/03*; **B29F** *5/02*

U.S. Cl. 264—24 **1 Claim**

1. A method of sinter molding an article, comprising the steps of:

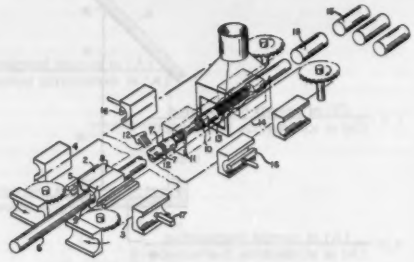
continuously transporting each of a pair of female mold halves open at opposite ends thereof in an endless path in one direction relative to the respective path;

bringing the paths together along a common portion thereof substantially coincident with a stationary elongate treating core;

engaging the mold halves at a first end of the common path portion proximate a first end of the core to provide a female mold open at opposite ends thereof and surrounding the periphery of the core in spaced relation thereto, whereby the mold cavity forms a passage for the core;

maintaining the engagement of the mold halves as they are transported along the common portion of the respective paths to cause the mold to traverse the core from end to end thereof;

electrostatically charging a fusible powder to a different potential from that of the mold;



spraying the charged powder from a nozzle provided on the core onto a surface within the mold as the mold traverses the nozzle, causing the powder to adhere to the surface by electrostatic attraction;

heating the powder until it fuses;

cooling the fused powder to solidification in the mold;

separating the paths at a second end of the common portion thereof beyond a second end of the core opposite the first end thereof;

whereby the mold halves are separated to eject the article from the mold as they are transported past the second end of the common path portion;

and controlling the temperature of each mold half as it is transported along the respective path.

4,009,235

METHOD FOR RECLAIMING EXTRUDED PLASTIC RESINS

Thomas W. Bober, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 14, 1975, Ser. No. 595,644

Int. Cl.² B29C *17/02*, *17/14*

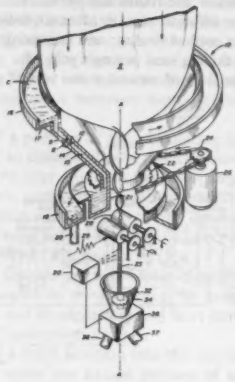
U.S. Cl. 264—40.2 **11 Claims**

1. A method for reclaiming a sheet of hot extruded plastic material comprising the steps of:

directing the hot material into the large end of a vertically oriented rotating, funnel-shaped device which engages the material and twists it about a longitudinal axis into a rope-like shape;

the material momentarily adhering to the walls of the device

when engaged thereby drawing the material to and through the small end of said funnel-shaped device; and



concurrently cooling the material as it passes through said device.

4,009,236

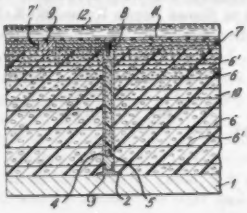
METHOD OF MAKING INSULATED TANK FOR LOW TEMPERATURE SERVICE

Kihei Katsuta, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 369,135, June 12, 1973. This application Oct. 2, 1974, Ser. No. 511,164

Int. Cl.² B29D *3/02, 9/00, 27/00*

U.S. Cl. 264—45.3 **7 Claims**



1. A method of making a heat-insulation lined tank for low temperature liquids, comprising: depositing foamable plastic material onto an inner surface of a tank to be heat insulated and foaming it onto said inner surface to form a first foam heat insulation layer; then depositing short staple glass fibers on said first heat insulation layer; subsequently forming a first wire layer by stretching spaced crossing wires over said short staple glass fibers on said first foam insulation layer and temporarily securing said wires to said first insulation layer by spot bonding said wires to said insulation layer; thereafter spraying additional foamable plastic material onto said wires and onto said glass fibers to form a second layer of plastic material and foaming said second layer of plastic material, thus forming a second foam insulation layer, said crossing wires preventing excessive displacement of the glass fibers by the plastic foam during foaming; then repeating the forgoing steps by depositing additional short staple glass fibers onto said second insulation layer, forming a subsequent net of less widely spaced crossing wires defining a second mesh smaller than said large mesh, temporarily securing the second mesh to said second insulation layer and subsequently spraying foamable plastic onto said wires and forming it to cover said second wire net with a third foam insulation layer thereover; and again repeating the steps by arranging over additional short staple glass fibers a third net of less widely spaced crossing wires and smaller mesh than said second mesh and foaming a layer of plastic thereover and thereafter forming a primary liquid-tight layer as the innermost layer of the tank.

4,009,237

PROCESS FOR PRODUCING SHAPED SYNTHETIC RESIN ARTICLES VARYING IN SHAPE OF LONGITUDINAL SECTION

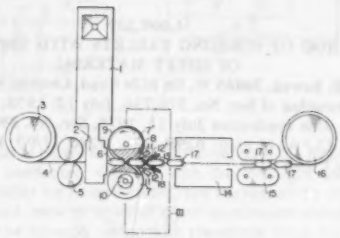
Takashi Kimura, Nishinomiya; Giichi Kawashima, Kyoto; Minoru Nagami, Takatsuki, and Minoru Hanada, Amagasaki, all of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed June 9, 1975, Ser. No. 584,877

Claims priority, application Japan, June 14, 1974, 49-67194

Int. Cl.² B29D *27/00;* **B29F** *3/012*

U.S. Cl. 264—46.3 **3 Claims**



1. A process for the continuous production of a shaped synthetic resin article varying in cross-sectional area and in its shape of longitudinal cross section along at least a part of its length, which comprises

extruding a molten polyethylene resin composition from an extruder die as an expanded polyethylene about a rope and between a pair of rolls rotating in the direction of extrusion so that the rolls of each pair contact each other on their periphery, the peripheral surfaces of the rolls being engraved so as to form a cavity into which the extrusion takes place and corresponding to the shape of said shaped article when the rolls contact each other while being rotated,

remolding in said cavity the expanded molten resin composition into an article having the desired shape, and at the same time, cutting off the surplus resin overflowing from said cavity by the edges of said cavity on the rolls, the edges of the cavity on one of the pair of rolls having a knife edge shape having an edge-width of 1 mm or less, and

then immediately quenching the thus molded article to solidify the same by blowing air or a mixture of air and water at 20° C or lower against the article.

4,009,238

PROCESS FOR THE PRODUCTION OF CERAMIC SUBSTRATES FOR THIN LAYER CIRCUITS

Karl Niedermeier, Aich, and Manfred Wintzer, Unterpfaffenhofen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 11, 1974, Ser. No. 449,751

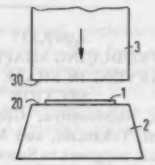
Claims priority, application Germany, Mar. 29, 1973, 2315797

Int. Cl.² B29D *7/22*

U.S. Cl. 264—61 **4 Claims**

1. In a process for the production of ceramic substrates for thin layer circuits in which a cast compound is produced and poured out in the form of a coating on a base in order to dry so that a leather-like tough, green substrate layer is formed

from which the required shapes can be punched out and then sintered, the sintering transforming the green substrate into a ceramic body from which the required shapes of ceramic substrates can be punched out, the improvement therein comprising the step of:



subjecting the green dried substrates to a pressure of up to approximately 1000 kilopond/cm between highly polished, plane parallel surfaces.

4,009,239

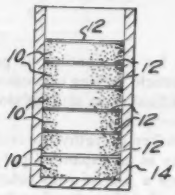
METHOD OF FORMING TABLETS WITH SEPARATORS OF SHEET MATERIAL

Max E. Bowen, 30885 W. Six Mile Road, Livonia, Mich. 48152

Continuation of Ser. No. 378,734, July 12, 1973, abandoned. This application July 11, 1975, Ser. No. 596,036

Int. Cl.² A61J *3/10*; **B29B** *1/32*; **B29C** *11/00*; **B29F** *5/00*

U.S. Cl. 264—112 **7 Claims**



1. A method of forming a tablet having a separator of sheet material, using a press having a ram, comprising: filling a female die cavity shaped complementary to the ram with a charge of powdered material suitable for tabletting by heat and pressure, covering the charge with a sheet material having a heat sensitive adhesive coating formed on a side adjacent said powdered material so the sheet material is disposed between the female die cavity and the press ram, heating the press ram, moving the ram in the direction of the die cavity so as to contact an uncoated side of the sheet material to first separate a section of said sheet material from a remainder thereof and then moving said ram into the die cavity to press said section under the force of the ram into contact with the powdered material so as to form a tablet conforming to the shape of the female die cavity, and having the section of sheet material covering one side thereof and adhered thereto be said adhesive to act as a separator.

4,009,240

METHOD AND APPARATUS FOR PURIFYING BLISTER FURNACE EFFLUENT

Ralph A. Koenig, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed June 18, 1975, Ser. No. 587,957

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 **6 Claims**

1. A process for purifying the charge and melt cycle, and poling cycle effluent from a copper blister furnace, comprising the steps during said charge and melt cycle of:

a. reducing the velocity of the effluent stream in a settling chamber so as to permit the larger particulate matter to drop out of the streams,

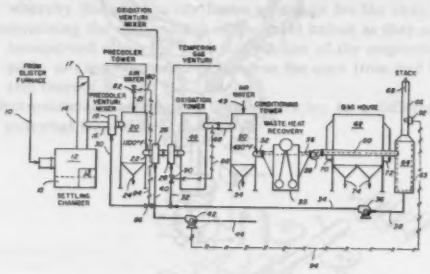
b. cooling the effluent streams with air and water;

c. thermally oxidizing with air the effluent stream at a temperature below the flame temperature,

d. cooling the effluent stream after oxidation, and

e. venting the cooled stream; and comprising the additional steps only during said poling cycle of:

f. stopping the flow of air and water to said cooling step (b),



g. recycling cooled gases from said venting to the input to said cooling step (b) as a function of the temperature of the outlet gases from said cooling step (b),

h. recycling cooled gases from said venting to the input to said oxidizing step (c) as a function of the temperature of the outlet gases from said oxidizing step (c) and

i. supplying air to the outlet gases from said cooling step (b) as a function of the oxygen content of the gases being vented.

4,009,241

METHOD OF REMOVING MERCURY VAPOR FROM GASES CONTAMINATED THEREWITH

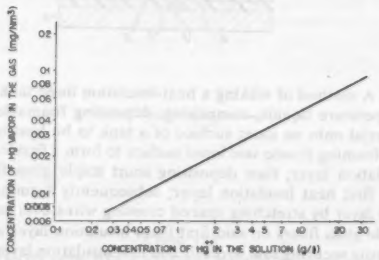
Buntaro Kawase, Tokyo; Iwao Kojima, Yokohama; Juichi Kasai, Fujisawa, and Keiji Kawasaki, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 288,386, Sept. 12, 1972, abandoned. This application Oct. 11, 1974, Ser. No. 513,948

Claims priority, application Japan, Sept. 16, 1971, 46-71211; Apr. 8, 1972, 47-34855

Int. Cl.² B01D *47/00*

U.S. Cl. 423—210 **6 Claims**



1. A method of reducing the content of mercury vapor from a gas contaminated therewith to less than 0.01 mg/Nm³ for purification of the gas comprising the steps of:

1. washing the contaminated gas in a lower gas-liquid contact zone of a two stage vertical washing tower with a circulating solution, which is acidified by sulfuric acid, containing therein divalent mercury ions with a concentration of from about 0.5 to 100 grams per liter, whereby the greater part of the mercury vapor in the gas contaminated therewith is taken out into the circulating solution in a form of monovalent mercury ions, obtaining a partly purified gas stream;

2. washing the partly purified gas stream obtained by step (1) in an upper gas-liquid contact zone of said two stage vertical washing tower with another circulating solution, which is acidified by sulfuric acid, containing therein divalent mercury ions with a concentration of from about 0.05 to 0.5 gram per liter, whereby the remnant part of the mercury vapor in the gas contaminated therewith is substantially taken out into the circulating solution in a form of monovalent mercury ions, obtaining a purified gas stream;
3. drawing off a portion of the circulating solution in step (1) in order to change almost all of monovalent mercury ions using a smaller amount of an oxidizing agent than the stoichiometric proportion therefor, and feeding the thus treated solution which is free of said oxidizing agent back to the circulating solution of step (1) accompanied with a replenishing fresh solution;
4. drawing off another portion of the circulating solution in step (1) in order to recover metallic mercury from the monovalent and divalent mercury ions contained therein by means of reduction; and
5. replenishing a fresh solution into the circulating solution of step (2), while any excess portion of said circulating solution is caused to flow down into the gas-liquid contact zone of step (1).

4,009,242
METAL OXYHALIDE CATALYZED REACTIONS

Alan Lauder, Newark, and Elrey L. McCann, III, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 8, 1975, Ser. No. 566,106
Int. Cl.² B01J 23/10
U.S. Cl. 423—213.2 **3 Claims**

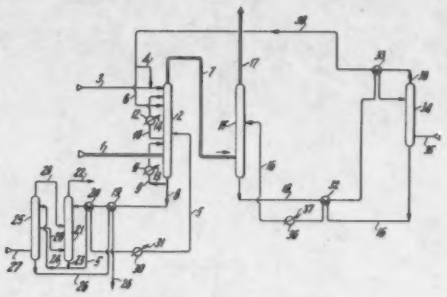
1. In the process of bringing into contact a gaseous stream comprising at least one oxidizable and at least one reducible reactant selected from oxygen, hydrogen, carbon monoxide, hydrocarbons and nitrogen oxides in the presence of a catalyst and under such conditions as to effect a change in the oxidation state of at least one reactant, the improvement which comprises bringing the reactants into contact in the presence of at least one catalytic compound of the general formula $ABO_{3-f}X_f$ and having a perovskite crystal structure; wherein A and B are each cations of at least one metal and at least about 1% of the Type B cations are derived from at least one catalytically active metal selected from metals of Groups VB, VIB, VIIB, VIII, IB and IIB of the Periodic Table; O is oxide; X is fluoride or chloride; and f is about from 0.01 to 2.5.

4,009,243
CONTINUOUS PROCESS FOR SCRUBBING OUT HYDROGEN SULFIDE AND AMMONIA FROM COKE OVEN GAS

Heinrich Weber; Gustav Chollat, and Dieter Lullhutte, all of Recklinghausen, Germany, assignors to Firma Carl Still, Germany

Continuation-in-part of Ser. No. 195,798, Nov. 4, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,725
Claims priority, application Germany, Nov. 18, 1970, 2056727
Int. Cl.² B01D 53/34
U.S. Cl. 423—234 **9 Claims**

1. In a process for removing hydrogen sulfide and ammonia from coke-oven gas by scrubbing in a scrubber, wherein the hydrogen sulfide is removed with aqueous ammonia while also using gaseous ammonia, the source of both the aqueous and gaseous ammonia being said coke-oven gas, and wherein the hydrogen sulfide is subsequently separated by distillation from the aqueous ammonia enriched with hydrogen sulfide and thereafter the lean aqueous ammonia recycled to said scrubber, and thereupon, the ammonia in excess contained in the coke-oven gas and not needed for the scrubbing is absorbed by aqueous mono-ammonium phosphate while forming di-ammonium phosphate and ammonia is separated from the ammonia-enriched aqueous ammonium phosphate by distillation, after a preliminary degassing and formation of ammonia-containing degassing gases as well as recovery of mono-ammonium phosphate, and processed to pure ammonia, the improvement wherein ammonia-containing degassing gases are introduced into said scrubber and said gases are used as gaseous ammonia in the scrubbing of hydrogen sulfide from the coke-oven gas, the ammonia in excess contained in the

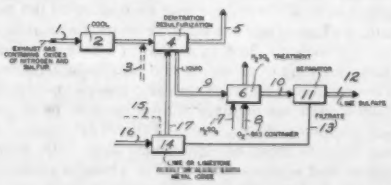


coke-oven gas is partly scrubbed out along with the hydrogen sulfide and conducted, together with the hydrogen sulfide, into a deacidifier for being distilled, and the rest of the ammonia is scrubbed out with aqueous mono-ammonium phosphate whereupon the aqueous ammonium phosphate strips the ammonia from the coke-oven gas and distillation vapors in scrubbers arranged in series, and the degassing gases contain 5 to 10% by weight of ammonia, a total of 2% by weight of hydrogen sulfide, carbon dioxide, hydrogen cyanide, carbon monoxide and hydrogen, as well as 88 to 93% by weight of water vapor.

4,009,244
PROCESS FOR REMOVING OXIDES OF NITROGEN AND SULFUR FROM EXHAUST GASES

Masumi Atsukawa; Naoharu Shinoda, and Kenji Inoue, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1975, Ser. No. 564,749
Claims priority, application Japan, Apr. 19, 1974, 49-44156
Int. Cl.² C01B 21/00
U.S. Cl. 423—235 **5 Claims**

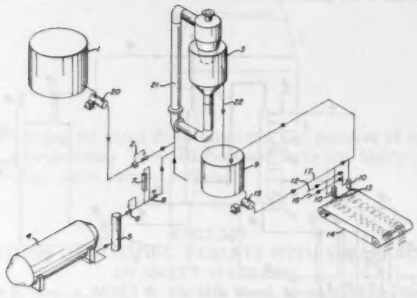


1. A process for removing oxides of nitrogen and of sulfur from exhaust gases, comprising washing exhaust gases containing the oxides of nitrogen and of sulfur with a slurry of lime or limestone, which slurry contains a alkali metal iodide or an alkaline earth metal iodide to convert the nitrogen oxide to nitrogen gas and the sulfur oxide to gypsum.

4,009,245
PROCESS FOR THE MANUFACTURE OF MONOAMMONIUM PHOSPHATE

John W. Hudson, and Robert A. Pendergrast, both of Atlanta, Ga., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1975, Ser. No. 554,298
Int. Cl.² C05B 19/00; C01B 25/28
U.S. Cl. 423—313 16 Claims



16. Method of making ammonium phosphate having a mole ratio of N:P of about 0.8:1 to 1.2:1 comprising

a. generating a slurry by reacting ammonia with phosphoric acid in a mole ratio of N:P of from about 1.35 to about 1.45 under agitation of the heat of reaction;

b. reacting said slurry with phosphoric acid to produce a reactant mixture having a mole ratio of N:P of from about 0.8:1 to about 1.2:1; and

c. passing the reactant mixture, while still undergoing an exothermic reaction, through at least one orifice onto a surface, said surface being located from about 6 to about 36 inches from said orifice to thereby produce a highly porous, easily friable ammonium phosphate product.

4,009,246
MANUFACTURE OF NITRATES

Martin Maurice Wendel, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 24,643, April 1, 1970, abandoned. This application Mar. 6, 1972, Ser. No. 232,179
Int. Cl.² C01B 21/50
U.S. Cl. 423—385 8 Claims

1. A process for the preparation of inorganic nitrites which consists essentially of forming a gaseous mixture comprising in parts by volume based upon the total parts of the gaseous mixture 0–10 parts oxygen, 2–12 parts nitrogen oxides at a state of oxidation of less than 50%, 15–20 parts water vapor and 83–58 parts inert gas at a pressure in the range 2–150 psig and a temperature above the dew point of said mixture and in the range 300°–500° C., rapidly quenching said mixture to a temperature less than about 120° C., said quenching being conducted in an absorption device by dispersing the mixture under the surface of and into intimate contact with an aqueous solution containing 1–73% by weight of a base selected from the class consisting of ammonia and alkali and alkaline earth metal hydroxides and carbonates, said gaseous mixture being maintained at a temperature above its dew point until it contacts said aqueous solution; and thereafter contacting the gaseous mixture from the quenching step with additional amounts of said aqueous solution of said base in an absorption tower while maintaining a covering of said aqueous solution of base over all surfaces of said tower exposed to parts of said gaseous mixture having a dew point above the temperature of said surfaces up to a height in the tower where at least about 90% by weight of the nitrogen oxides originally present in said mixture are absorbed in said aqueous solution; said state of oxidation being defined as

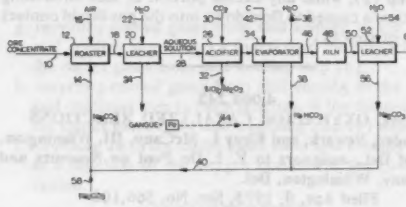
$$\frac{\text{moles } e\ NO_2}{\text{moles NO + moles } e\ NO_2} \times 100$$

wherein $e\ NO_2$ is determined by adding two times the number of moles of N_2O_4 to the number of moles of NO_2.

4,009,247
PRODUCTION OF METAL CARBIDES

Allan M. Smellie, Mississauga, and Hans G. Brandstatter, Welland, both of Canada, assignors to Ontario Research Foundation, Sheridan Park, Canada

Continuation-in-part of Ser. No. 480,829, June 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 386,019, Aug. 6, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,246
Int. Cl.² C01B 31/34
U.S. Cl. 423—440 15 Claims



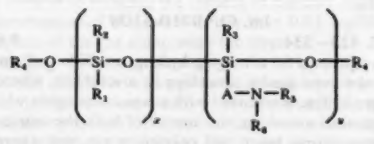
1. A process for the production of a chromium carbide, which comprises forming an intimate admixture of finely-divided carbon and sodium dichromate or sodium chromate, and reducing said sodium dichromate or sodium chromate with said carbon in a reaction zone to form a chromium carbide by an in situ solid state reaction at a temperature of about 1025° C to about 1425° C while carbon monoxide formed in said solid state reaction is removed from said reaction zone.

4,009,248
PROCESS FOR PRODUCING CARBON FIBERS

Soichiro Kishimoto, and Saburo Okazaki, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Mar. 31, 1976, Ser. No. 672,534
Claims priority, application Japan, Apr. 4, 1975, 50-41400
Int. Cl.² D01F 9/12
U.S. Cl. 423—447.4 12 Claims

1. In a process for producing carbon fibers which comprises heating acrylonitrile fibers made from an acrylonitrile homopolymer or an acrylonitrile copolymer containing at least 85 mole % acrylonitrile, the improvement wherein the acrylonitrile fiber contains at least 0.01%, based on the weight of the fiber, of an aminosiloxane of the formula:



wherein

R_1 is hydrogen or a lower alkyl or aryl group,

R_2 and R_3 are lower alkyl or aryl groups,

R_4 is hydrogen or a group of

wherein

R_7 and R_8 are lower alkyl groups,

R_9 is hydrogen or a lower alkyl group,

R_5 and R_6 are hydrogens or lower alkyl groups,

A is an alkylene group having two to five carbon atoms or a phenylene group,

x and y are positive integers and the molecular weight of the aminosiloxane is not more than 100,000.

4,009,249

PREPARATION OF RED AMORPHOUS SELENIUM

David A. Buckley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 495,242, Aug. 6, 1974, Pat. No. 3,954,951. This application Jan. 16, 1976, Ser. No. 649,960

Int. Cl.² C01B *19/00*

U.S. Cl. 423—510 **3 Claims**

1. A process for producing stable red amorphous selenium containing a halogen in particles of less than about 5 microns which comprises:

a. dissolving a sufficient amount of selenious acid in a mixed solution of methanol or ethanol containing hydrazine, the amount of hydrazine being at least stoichiometrically equivalent to the amount of selenious acid in the solution, and containing not more than about 50 percent by weight water at a temperature between about −20° C. and the freezing point of the solution;

b. then maintaining the solution between about −13° C. and −3° C. until the yellow-orange amorphous precipitate formed by the reduction of the selenious acid by the hydrazine changes to red amorphous selenium;

c. then filtering the solution;

d. then washing the precipitate with methanol or ethanol and drying; and

e. then adding from about 10 parts per million to 10,000 parts per million of a halogen.

4,009,250

CONTACT METHOD OF PRODUCING SULPHURIC ACID

Vasily Nikolaevich Novozhilov, ulitsa Novatorov, 22, kv. 30, Moscow, U.S.S.R.; Boris Vladimirovich Nekrasov, Ferganskaya ulitsa, 24, kv. 83, Moscow, U.S.S.R.; Pavel Alexeevich Semenov, deceased, late of Moscow, U.S.S.R.; Vera Vasilievna Semenova, administratrix, Yartsevskaya ulitsa, 27, korpus 6, kv. 61, Moscow, U.S.S.R.; Irina Pavlovna Semenova, administratrix, Banny pereulok, 7, korpus 2, kv. 38, Moscow, U.S.S.R., and Sergei Pavlovich Semenov, administrator, ulitsa Gertsena, 5/7, kv. 2, Moscow, U.S.S.R.

Continuation of Ser. No. 452,467, March 18, 1974, abandoned. This application May 21, 1975, Ser. No. 579,590

Int. Cl.² C01B *17/72, 17/68;* **B01D** *53/00*

U.S. Cl. 423—522 **2 Claims**

1. In a contact method of producing sulphuric acid comprising the steps of roasting a stock material selected from the group consisting of sulphur and pyrite to form a gaseous mixture containing sulphurous acid anhydride and having a moisture content not higher than 0.02 percent by volume, oxidizing the sulphurous acid anhydride in said gaseous mixture into sulphuric anhydride, and successively contacting said gaseous mixture at a temperature of from 30°–125° C with at least one separate batch of a 92-98 percent sulphuric acid solution in relative quantities, sufficient to absorb from said gaseous mixture a substantial portion of the sulphuric anhydride remaining therein while increasing the sulphuric acid concentration of each batch of solution so contacted; the improvement whereby the sulphuric acid fog content in the gaseous mixture exhaust is maintained at a maximum of 0.15 g/cu.m, comprising the steps of limiting the quantity of each separate batch of sulphuric acid solution so contacted to from about 0.45 to about 1.47 kg per kg of said gaseous mixture being contacted while maintaining the flow velocity of said gaseous mixture at from about 13.4 to about 15.2 normal meters per second.

4,009,251

PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS STREAMS BY CATALYTIC OXIDATION OF HYDROGEN SULFIDE TO SULFUR WHILE INHIBITING THE FORMATION OF SULFUR OXIDES

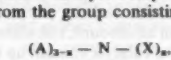
Walter C. Meuly, Piscataway Township, Middlesex County, N.J., assignor to Rhodia, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 391,922, Aug. 27, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,576

Int. Cl.² B01D *53/34;* **C01B** *17/04*

U.S. Cl. 423—573 G **19 Claims**

1. A cyclic process for the removal of hydrogen sulfide and alkyl mercaptans contained in gaseous streams, and the substantially quantitative catalytic conversion thereof to elemental sulfur and dialkyl disulfides, respectively, while inhibiting the formation of acidic sulfur oxides, which comprises contacting the gaseous stream with an aqueous solution consisting essentially of a water-soluble polyvalent metal chelate catalyst retaining the metal in soluble form in the aqueous solution and having a pH within the range from about 3 to about 11, the chelate catalyst comprising a chelating amino acid selected from the group consisting of:



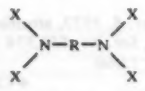
I

wherein

n is a number from 1 to 3;

X is selected from the class consisting of acetic and propionic acid groups;

A is 2-hydroxy ethyl, 2-hydroxy propyl, or an alkyl group having from one to about four carbon atoms.

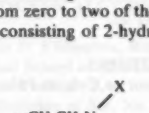


II.

wherein

from two to four of the groups X are selected from the class consisting of acetic and propionic acid groups;

from zero to two of the groups X are selected from the class consisting of 2-hydroxy ethyl, 2-hydroxy propyl, and



;

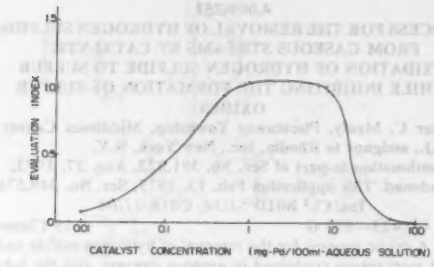
R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen are in the 1,2-position;

and an alkali metal, alkaline earth metal, ammonium or amine salt of an acid other than the chelating amino acid having a pK within the range from about 1.2 to about 6 in an amount within the range from 1 to 14 equivalents calculated as Fe equivalents; contacting aqueous polyvalent metal chelate catalyst solution with free oxygen gas to regenerate the catalyst for contact with another portion of the gaseous stream; and separating the sulfur and any dialkyl disulfides from the aqueous metal chelate solution.

4,009,252
PROCESS FOR PREPARING HYDROGEN PEROXIDE

Yusuke Izumi, Shinnanyo; Hidetaka Miyazaki, and Shin-ichi Kawahara, both of Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

Filed June 23, 1975, Ser. No. 589,776
Claims priority, application Japan, July 2, 1974, 49-75040
Int. Cl.² C01B 15/02
U.S. Cl. 423—584 9 Claims



1. A process for preparing hydrogen peroxide which comprises reacting hydrogen with oxygen in an aqueous medium containing a platinum-group catalyst, characterized in that the partial pressure of hydrogen and the partial pressure of oxygen in the gaseous phase of the reaction system are maintained at at least 0.5 atmosphere and at least 1.0 atmosphere respectively, and in that the ratio of the partial pressure of oxygen to that of hydrogen in the gaseous phase of the reaction system is maintained within the range of 1.5 to 20, and the platinum group catalyst is caused to be present in an amount, calculated as metal, of at least a minimum effective catalyst amount up to 30 mg per 100 ml. of said aqueous medium.

4,009,253
4-CYCLOHEXYL-4-METHYL-2-PENTANONE USEFUL AS A MALODOR COUNTERACTANT

Alfred A. Schleppnik, St. Louis, Mo., and Steve G. Vanata, Midland Park, N.J., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 413,082, Nov. 5, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 558,574
Int. Cl.² A61L 9/04, 13/00
U.S. Cl. 424—45 4 Claims

1. A method of treating malodors to alleviate their offensive odors which comprises treating the air containing the malodor with an amount of 4-cyclohexyl-4-methyl-2-pentanone which is effective to counteract the malodor.

4,009,254
TOPICAL COMPOSITIONS

Adolph Renold, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 467,024, May 6, 1974, abandoned, which is a continuation of Ser. No. 137,678, April 26, 1971, abandoned. This application Feb. 25, 1976, Ser. No. 661,203
Int. Cl.² A61K 7/42, 7/44, 31/08
U.S. Cl. 424—59 10 Claims

1. A human skin treating composition consisting essentially of a sunscreen agent and, 5 to 99.8% of an unsymmetrical ether of the formula R_1-O-R_2, wherein R_1 is alkyl or alkenyl of 8 to 20 carbon atoms and R_2 is C_{1-3} alkyl or C_{2-3} alkenyl, and said ether being present in an amount effective to enhance penetration of said agent into the skin.

8. A method comprising treating human skin with a composition containing an unsymmetrical ether of the formula R_1-O-R_2, wherein R_1 is alkyl or alkenyl of 8 to 20 carbon atoms and R_2 is C_{1-3} alkyl or C_{2-3} alkenyl in an amount which readily penetrates and lubricates the skin.

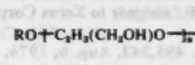
4,009,255
HAIR TREATING COMPOSITIONS CONTAINING CATIONIC SURFACE ACTIVE AGENTS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Mitry-Mory, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 187,151, Oct. 6, 1971, Pat. No. 3,879,464, which is a continuation-in-part of Ser. No. 655,336, July 24, 1967, abandoned. This application Feb. 6, 1975, Ser. No. 547,465
Claims priority, application Luxembourg, July 26, 1966, 51645; May 12, 1967, 53667
Int. Cl.² A61K 7/06
U.S. Cl. 424—70 19 Claims

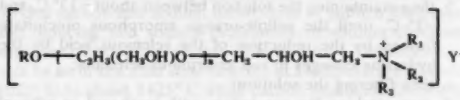
1. A cosmetic composition for treating the hair comprising an aqueous solution of a cationic surface active agent selected from the group consisting of

1. a mixture of compounds having the formula



wherein R is selected from the group consisting of alkyl having 8–22 carbon atoms, alkenyl having 8–22 carbon atoms and alkyl phenyl having 8–22 carbon atoms, R_1 and R_2 each independently are selected from the group consisting of lower alkyl having 1 –4 carbon atoms and hydroxy lower alkyl having 1–4 carbon atoms or together with the nitrogen atom to which they are attached form a ring selected from the group consisting of morpholine and piperidine, and n has a statistical average value of 0.5–10 and

2. a mixture of compounds which are the quaternary ammonium salts of (1) having the formula



wherein R, R_1, R_2 and n have the meanings given above, R_3 is selected from the group consisting of methyl and ethyl and Y is an anion selected from the group consisting of Cl, Br,I, SO_4CH_3, $SO_4C_2H_5$, CH_3SO_3 and

said cationic surface active agent being present in amounts of about 0.1 to 10 percent by weight thereof.

4,009,256
NOVEL SHAMPOO COMPOSITION CONTAINING A WATER-SOLUBLE CATIONIC POLYMER

Frank A. Nowak, Jr., Bound Brook; Albert L. Micchelli, Middletown, and Gerard J. Legato, Stirling, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 417,260, Nov. 19, 1973, abandoned. This application Nov. 13, 1975, Ser. No. 631,519
Int. Cl.² A61K 7/06
U.S. Cl. 424—70 5 Claims

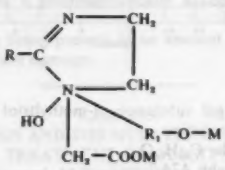
1. A shampoo composition comprising an aqueous solution of:

A. from 0.1 to 10.0 percent, by weight, of the total solution of a water-soluble acid salt of an aminoalkyl ester of a cationic polymer having a molecular weight of 5,000 to

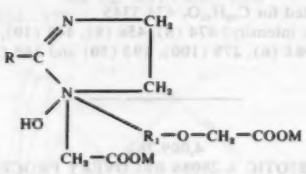
250,000 and selected from the group consisting of aminoalkyl esters of (a) a homopolymer of a homopolymerizable unsaturated carboxylic acid having 3 to 5 carbon atoms, (b) a copolymer of a copolymerizable mixture of unsaturated carboxylic acids having 3 to 5 carbon atoms, and (c) a copolymer of at least one of said acids having 3 to 5 carbon atoms and at least one copolymerizable ethylenically unsaturated comonomer selected from the group consisting of vinyl acetate, vinyl propionate, vinyl methyl ether, vinyl ethyl ether, the C_1-C_{18} alkyl half esters of maleic and fumaric acids, amides of acrylic and methacrylic acids, and the C_1-C_{18} alkyl and C_2-C_4 hyroxyalkyl esters of acrylic and methacrylic acids, wherein the copolymers of group (c) are prepared with at least 50 mole percent of the unsaturated carboxylic acid component,

B. from 1 to 25 percent, by weight, of the total solution of an amphoteric detergent selected from the group consisting of

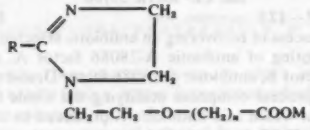
a. an imidazoline derivative corresponding to the formula



b. an imidazoline derivative corresponding to the formula

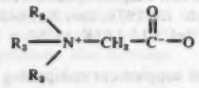


c. an imidazoline derivative corresponding to the formula



wherein R is an alkyl group having 8–18 carbon atoms, R_1 is a bivalent lower alkyl group having 2–4 carbon atoms, M is selected from the group consisting of alkali metals and hydrogen, and n is an integer from 3 to 9,

d. higher alkyl and higher alkyl amide betaines corresponding to the structure



wherein R_2 is selected from the group consisting of C_8-C_{18} alkyl groups, C_8-C_{18} amido groups; C_8-C_{18} alkyl groups substituted with ether or ester linkages or hydrogen substituted groups and R_3 is a C_1-C_{18} alkyl group,

e. an N-alkyl-beta-aminopropionic acid wherein the alkyl group contains 8–18 carbon atoms,

f. C_8-C_{18} amino sulfonates, and

g. the sulfonated alkyl amides wherein the alkyl groups contain 8 to 18 carbon atoms; and

C. from 0 to 20 percent, by weight of the total solution, of at least one surfactant selected from the group consisting of nonionic surfactants, ionic surfactants and combinations thereof other than amphoteric detergents of part B wherein any plurality of ionic surfactants utilized consists of those of the same ionogenic class.

4,009,257

PREPARATION OF IMMUNOSUPPRESSIVE MATERIALS

Derek Thomas, West Wickham, and Heddy Zola, Rugby, both of England, assignors to Burroughs Wellcome, Inc., Research Triangle Park, N.C.

Filed Feb. 24, 1971, Ser. No. 118,532

Claims priority, application United Kingdom, Feb. 27, 1970, 9647/70

Int. Cl.² A61K *35/14, 35/26*

U.S. Cl. 424—85 **11 Claims**

1. A method of preparing an immunosuppressive and nontoxic antilymphocytic serum, comprising the immunisation of a mammal other than man with an immunogenically effective amount of a soluble immunogenic extract of human blood lymphocytes so as to immunise said mammal, removal of blood from said mammal, isolation of said serum from said blood, and the rendering of said serum sterile and isotonic;

said extract comprising primarily a mixture of macromolecular components, each having a molecular weight between 10,000 and 1,000,000, a particle size not greater than 0.22 micron, a protein content of between 50 and 100%, a lipid content below 30% and a carbohydrate content below 20%, said percentage values being by weight of dry weight of said extract excluding salts, the solubility of said extract being such that 10 mg. of the extract in 1 ml. of 0.85% w/v aqueous sodium chloride solution is visually a clear solution.

4,009,258

INFLUENZA VACCINE CONTAINING A RECOMBINANT, ANTIGENICALLY HYBRIDIZED VIRUS AND METHOD OF USING THE SAME

Edwin D. Kilbourne, Ridgewood, N.J., assignor to The Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Continuation of Ser. No. 291,797, Sept. 25, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,716

Int. Cl.² A61K *39/12;* **C12K** *5/00, 7/00*

U.S. Cl. 424—89 **8 Claims**

1. A method of influenza immunication comprising administering to a human or an animal subject to infection by natural means by naturally occurring influenza virus, by injecting an effective amount of a vaccine which comprises as an active ingredient, a recombinant, antigenically hybridized virus which contains a hemagglutinin antigen which has substantially no crossreactivity with a challenge natural contemporaneous or naturally infective wild type influenza virus and a neuraminidase antigen which has substantial cross-reactivity with such a challenge influenza virus, said recombinant being derived from viruses which are not neurovirulent, the concentration of said virus in said vaccine being sufficient to immunize the human or animal.

4,009,259
IMMERSION METHOD FOR TREATING AQUATIC ANIMALS

Roland W. Ament, Arvada, Colo., and Daniel C. Fender, Seattle, Wash., assignors to Wildlife Vaccines, Inc., Wheat Ridge, Colo.

Filed Oct. 3, 1975, Ser. No. 619,434
Int. Cl.² A61K *39/12, 39/02, 33/42*
U.S. Cl. 424—89 **22 Claims**

1. The method of treating water-living animals to impart a health and/or welfare enhancing agent thereto, which comprises contacting the water-living animals with a hyperosmotic solution and thereafter contacting the water-living animals with a health and/or welfare enhancing agent for a sufficient period of time for the water-living animals to absorb the said agent.

4,009,260
FRACTIONATION OF SPERM

Ronald J. Ericsson, Sausalito, Calif., assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

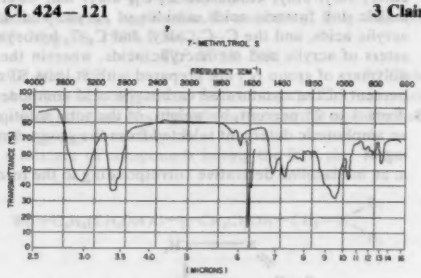
Continuation-in-part of Ser. No. 391,471, Aug. 24, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,728
Claims priority, application Germany, Apr. 19, 1973, 2321000
Int. Cl.² A61K *35/52;* **C12K** *9/00*
U.S. Cl. 424—105 **37 Claims**

1. A process for increasing the proportion of Y-sperm in mammalian sperm, which comprises the steps of a) maintaining at least the sperm portion of progressively motile sperm-containing semen, either as such or suspended in an aqueous suspending vehicle physiologically acceptable to the sperm, as an upper layer in vertical interfacial contact, at a temperature at which the motile sperm are motile, with a lower discrete layer of a first aqueous contacting medium physiologically acceptable to the sperm and in which the motile sperm migrate downwardly at a slower rate than in the upper layer, until a portion only of the motile sperm of the semen having migrated downwardly into the contacting medium, thereby producing a contacting medium containing a higher proportion of Y to X sperm than in the starting sperm, and b) repeating the step at least once, employing in the upper layer the motile sperm which have migrated to the first aqueous contacting medium and as the lower layer a second aqueous contacting medium physiologically acceptable to the sperm and in which the motile sperm migrate downwardly at a slower rate than in the first contacting medium.

4,009,261
7-SUBSTITUTED TRIOL DERIVATIVES OF ACID S, AN ANTIBIOTIC PRODUCED BY POLYANGIUM CELLULOSUM VAR. FULVUM

David T. Connor, Parsippany; Samuel M. Ringel, Rockaway, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 7, 1975, Ser. No. 602,606
Int. Cl.² A61K *35/74*
U.S. Cl. 424—121 **3 Claims**



1. An antifungal substance, 7-methyltriol S, having the following characteristics:
Empirical formula: $C_{29}H_{46}O_5$
Molecular weight: 474.7
Infrared Spectrum as shown in FIG. 1: ν max 3500–3200-cm^{-1}
Mass Spectrum:
Observed molecular ion 474.3290
Calculated for $C_{29}H_{46}O_5$ 474.3345
m/e (relative intensity) **474 (8), 456 (8), 445 (10), 438 (4), 379 (2), 361 (6), 279 (100), 193 (50)** and **165 (52).**

4,009,262
ANTIBIOTIC A-28086 RECOVERY PROCESS

LaVerne D. Boeck, Indianapolis, and David H. Berg, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 21, 1975, Ser. No. 569,712
Int. Cl.² A61K *35/00*
U.S. Cl. 424—123 **10 Claims**

1. The process of recovering an antibiotic selected from the group consisting of antibiotic A-28086 factor A, antibiotic A-28086 factor B, antibiotic A-28086 factor D, and salinomycin, which process comprises acidifying the whole fermentation broth in which said antibiotic is produced to a range of from about pH 2.0 to about pH 4.0 and separating the culture solids containing said antibiotic.

4,009,263
ENERGIZED COBALT-CONTAINING ANIMAL FEED

LaVerne Shafer, R.F.D., Cleghorn, Iowa 51041

Filed Feb. 15, 1974, Ser. No. 442,854
Int. Cl.² A61K *33/24*
U.S. Cl. 424—131 **33 Claims**

1. An animal feed supplement comprising an animal feedstuff selected from the group consisting of solid and liquid saccharifierous substances and containing cobalt in polarized form.

31. An animal feed supplement comprising the reaction product of a cobalt compound and lactic acid in the temperature range 75°–98° F., the cobalt in said reaction product being in polarized form.

4,009,264
COMPLEXES OF POLYSACCHARIDES OR DERIVATIVES THEREOF WITH REDUCED GLUTATHIONE AND PROCESS FOR PREPARING SAID COMPLEXES

Akihiro Mizutani, Tenjin, Japan, assignor to Meito Sangyo Kabushiki Kaisha, Japan

Filed Apr. 1, 1975, Ser. No. 564,212
Claims priority, application Japan, Mar. 3, 1975, 50-24969; Mar. 3, 1975, 50-24970
Int. Cl.² A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 4 Claims

3. A pharmaceutical composition for protection against radiation damage, which comprises a complex of a polysaccharide with reduced glutathione, said complex having an infrared absorption spectrum without an absorption peak at about 2500 cm^{-1}, which peak appears in the infrared absorption spectrum of said reduced glutathione;

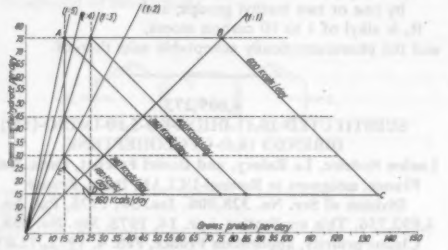
said polysaccharide being a member selected from the group consisting of dextran, hydrogenated dextran, hydroxyalkyl dextran, carboxyalkyl dextran and dextran sulfate; and a pharmaceutically acceptable carrier or diluent;

said complex being present in an amount effective to prevent radiation damage.

4,009,265
METHODS AND FORMULATIONS FOR THE TREATMENT OF OBESITY

Alan Norman Howard, 10 Topcliffe Way, Cambridge, England

Filed Mar. 5, 1973, Ser. No. 338,257
Claims priority, application United Kingdom, Mar. 6, 1972, 10439/72
Int. Cl.² A01N *9/00*, *9/28*
U.S. Cl. 424—177 20 Claims



1. A method for treating obesity in which an individual ingests on a daily basis a dietary formulation which comprises:

a. all the minerals required by man;

b. proteinaceous material selected from at least one member of the class consisting of:

i. a mixture of monomeric L-aminoacids, and

ii. natural proteins, and

iii. natural proteins reinforced with at least one monomeric L-aminoacid; and

c. digestible carbohydrate;

characterized in that the smallest amont of the dietary formulation containing at least the minimum daily requirements of each of the minerals required by man, including at least 800 mg calcium, 800 mg phosphorous, 140 μg iodine, 10 mg iron and 350 mg magnesium, also contains:

A. at least 15 g of said proteinaceous material which must include at least the minimum daily requirements for man of all the essential L-aminoacids requied by man; and

B. from 15 to 75 g of said carbohydrate, and further characterized in that the total caloric value of said smallest amount of dietary formulation is in the range of from 160 to 600 Kcals.

and wherein the amount of said dietary formulation ingested daily by said individual is such that it provides said individual with: at least 15 g of said proteinaceous material; from 15 to 75 g of said carbohydrate; and 160 to 600 Kcals.

4,009,266
METHOD OF TREATMENT OF NEMATODE PARASITE INFECTIONS IN DOMESTIC ANIMALS

Liyew Ayalew, 275 Seigneurial West, Apt. 10, St. Bruno, Quebec, Canada

Filed June 26, 1975, Ser. No. 590,781
Claims priority, application Canada, July 10, 1974, 204497
Int. Cl.² A61K *37/32*, *37/24*, *31/56*
U.S. Cl. 424—177 7 Claims

1. A method of treatment for the control of gastrointestinal nematode parasites in domestic animals infected with inhibited or inhibition-prone larvae of such parasites which comprises administering successively or concurrently from 1 microgram to 500 micrograms per kilogram of animal weight of a lactogenic substance and from 10 milligrams to 750 milligrams per kilogram of animal weight of an anthelmintic agent.

4,009,267
CROSS-LINKED ORGOTEIN

Wolfgang Huber, Atherton; Mark G. Saifer, Berkeley, and Lewis D. Williams, Menlo Park, all of Calif., assignors to Diagnostic Data, Inc., Mountain View, Calif.

Filed Sept. 9, 1975, Ser. No. 611,658
Int. Cl.² A61K *37/02*, *37/14*; C07G *7/04*
U.S. Cl. 424—177 12 Claims

1. A water-soluble, injectable cross-linked orgotein having a molecular weight of up to 500,000, wherein an orgotein molecule is intermolecularly cross-linked by at least one organic bridging group with at least one molecule of a watersoluble, injectable non-antigenic protein, said organic bridging group being formed by the reaction of orgotein or a mixture of orgotein and another water-soluble, injectable non-antigenic protein, with an organic difunctional cross-linking agent.

12. A pharmaceutical composition having antiinflammatory activity comprising, in admixture with a pharmaceutically acceptable carrier, an antiinflammatorily effective unit dosage amount of the cross-linked orgotein of claim 1.

4,009,268
COMPOSITION AND METHOD FOR REDUCING THE INCIDENCE OF SCOURS IN NEO-NATAL RUMINANTS

Bartley P. Cardon, and Howard M. Frederick, both of Tucson, Ariz., assignors to Arizona Feeds, Tucson, Ariz.

Continuation-in-part of Ser. No. 326,629, Jan. 26, 1973, Pat. No. 3,911,114. This application Oct. 6, 1975, Ser. No. 619,904
Int. Cl.² A61K *31/715*, *33/00*
U.S. Cl. 424—180 12 Claims

1. The method of reducing the incidence of sours in neonatal ruminant animals, comprising feeding to the animal an aqueous mixture containing an effective amount of pregelatinized starch.

4,009,269
ANTIBIOTIC COMPOSITIONS AND METHODS FROM *MICROMONOSPORA PURPUREA* JI-20

Jan Ilavsky, Livingston; Aris P. Bayan, New Brunswick; William Charney, Montclair, and Hans Reimann, Wayne, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 414,492, Nov. 9, 1973, Pat. No. 3,903,072, which is a continuation-in-part of Ser. No. 261,753, June 12, 1972, abandoned. This application June 9, 1975, Ser. No. 584,791
Int. Cl.² A61K *31/71*
U.S. Cl. 424—181 6 Claims

1. A composition having antibiotic activity, said composition consisting essentially of a mixture of gentamicin, Antibiotic JI-20A and Antibiotic JI-20B.

4,009,270

METHOD FOR TREATING SPINAL CORD INJURY

James V. Gainer, Jr., Kingwood, W. Va., assignor to The University of Virginia, Charlottesville, Va.

Filed Nov. 21, 1975, Ser. No. 634,149
Int. Cl.² A61K *35/78, 31/70, 31/045*
U.S. Cl. 424—195 **5 Claims**

1. A method for the treatment of spinal cord injuries comprises administering to a host inflicted with injury or expected to be inflicted with injury resulting in a traumatized, ischemic spinal cord, an effective dose of a water-soluble carotenoid sufficient to reduce secondary necrosis of neural tissue.

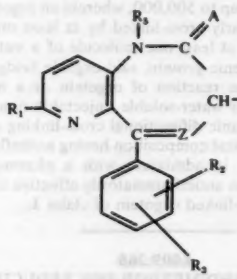
4,009,271

6-AZA-3H-1,4-BENZODIAZEPINES

Walter vonBebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 460,525, April 12, 1974, Pat. No. 3,941,775. This application June 25, 1975, Ser. No. 590,285
The portion of the term of this patent subsequent to Feb. 1, 1989, has been disclaimed.
Int. Cl.² C07D *471/04*; A61K *31/44*
U.S. Cl. 424—248.57 **12 Claims**

1. A 6-aza-3H-1,4-benzodiazepine or 6-aza-1,2-dihydro-3H-1,4-benzodiazepine of the formula:



I

wherein:

R_1 is the group $-NR_aR_b$ or $N^+R_aR_bR_cX^-$ where R_a and R_b, are hydrogen, alkyl groups of 1 to 6 carbon atoms, benzyl, or alkyl groups of 1 to 6 carbon atoms substituted by a single hydroxy, and R_c is alkyl of 1 to 6 carbon atoms with the proviso that when R_c is present R_a and R_b are both alkyl of 1 to 6 carbon atoms and wherein the group $-NR_aR_b$ also can be morpholino, pyrrolidino, piperidino, homopiperidino, piperazino or N-alkyl piperazino having 1 to 6 carbon atoms in the alkyl group; X^- is a halide, sulfate, acetate, citrate or p-toluene sulfonate;

R_2 and R_3 are hydrogen, halogen, trifluoromethyl, nitro, nitrile, hydroxy, lower alkyl or lower alkoxy;

R_4 is hydrogen;

Z is a nitrogen atom or the NO group;

R_5 is hydrogen, lower alkyl, lower alkenyl, aminoalkyl of 2 to 4 carbon atoms, mono or di lower alkyl substituted aminoalkyl of 2 to 4 carbon atoms; and

A is oxygen, and compounds where the $-N(R_5)-C(=A)$ group in formula I is replaced by the tautomeric form $-N=C(AR_5)$, and pharmaceutically acceptable salts and quarternary ammonium and alkyl ammonium compounds thereof.

10. A method of inducing a psychosedative or anxiety relieving effect in a mammal comprising administering to the mammal an amount of the compound of claim 1 sufficient to induce such effect.

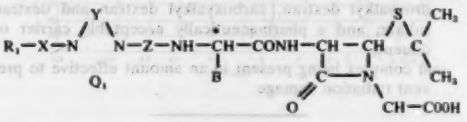
4,009,272

PENICILLINS

Hans-Bodo Konig; Wilfried Schrock, and Karl-Georg Metzger, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 502,956, Sept. 3, 1974, Pat. No. 3,974,142, which is a continuation-in-part of Ser. Nos. 299,246, Oct. 20, 1972, abandoned, and Ser. No. 300,776, Oct. 20, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,742
Claims priority, application Germany, Oct. 23, 1971, 2152967; Oct. 23, 1971, 2152968
Int. Cl.² A61K *31/505*
U.S. Cl. 424—251 **60 Claims**

56. The method of combatting bacterial infections in animals and humans which comprises administering to said animal or human an antibacterially effective amount of a compound selected from the group consisting of a penicillin of the formula:



wherein the carbon atom designed by * constitutes a center of chirality;

X is —CO—, —CS— or $—SO_2—$;

each of Y and Z, independently of the other, is —CO—or —CS—;

B is thienyl, cyclohexenyl, cyclohexa-1,4-dien-1-yl, phenyl or phenyl substituted by one or two members selected from the group consisting of halo, nitro, hydroxy, methoxy, methylthio and alkyl of 1 to 5 carbon atoms;

Q_1 is ethylene or trimethylene unsubstituted or substituted by one or two methyl groups; and

R_1 is alkyl of 1 to 10 carbon atoms;

and the pharmaceutically acceptable salts thereof.

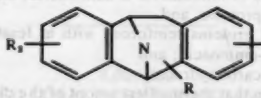
4,009,273

SUBSTITUTED 10,11-DIHYDRO-5,10-IMINO-[5H] DIBENZO (a,d)-CYCLOHEPTENE

Lucien Nedelec, Le Raincy, and Daniel Frechet, Paris, both of France, assignors to Roussel-UCLAF, Paris, France

Division of Ser. No. 328,006, Jan. 30, 1976, Pat. No. 3,892,756. This application Apr. 14, 1975, Ser. No. 568,148
Claims priority, application France, Feb. 4, 1972, 72.03778
Int. Cl.² C07D *471/08*
U.S. Cl. 424—258 **12 Claims**

1. A compound selected from the group consisting of racemates and optically active isomers of a compound of the formula

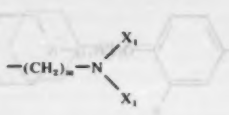


wherein R is selected from the group consisting of $—(CH_2)_n—COCH_3$ where *n* is O or 1,

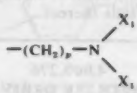
wherein X is selected from the group consisting of lower alkyl, phenyl, nitro-phenyl,

phenylalkyl of 7 to 8 carbon atoms,

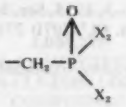
acyl of a saturated aliphatic mono carboxylic acid of 1 to 6 carbon atoms optionally substituted with



where *m* is an integer from O to 6 and X_1 is selected from the group consisting of hydrogen and lower alkyl,

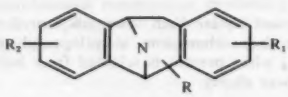


where *p* is an integer from 1 to 6 and X_1 is as before,



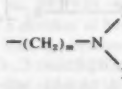
wherein X_2 is lower alkyl,
and R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, CF_3- and diloweralkylamino and the non-toxic, pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

9. A composition for stimulating the central nervous system comprising an amount sufficient to stimulate the central nervous system of a compound selected from the group consisting of a compound of the formula

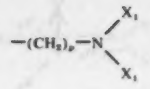


wherein R is selected from the group consisting of
hydrogen,
lower alkyl optionally substituted with hydroxy or halogen,
lower alkenyl,
lower alkynyl,
$-(CH_2)_nCOCH_3$ where *n* is O or 1,

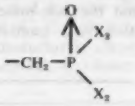
wherein X is selected from the group consisting of lower alkyl, phenyl, nitro-phenyl,
phenylalkyl of 7 to 8 carbon atoms,
acyl of a saturated aliphatic mono carboxylic acid of 1 to 6 carbon atoms optionally substituted with



where *m* is an integer from O to 6 and X_1 is selected from the group consisting of hydrogen and lower alkyl,



where *p* is an integer from 1 to 6 and X_1 is as before,

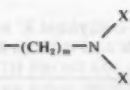


wherein X_2 is lower alkyl,
and R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, CF_3- and diloweralkylamino and the non-toxic, pharmaceutically acceptable acid addition and quaternary ammonium salts thereof and an inert pharmaceutical carrier.

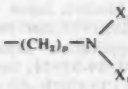
10. A method of stimulating the central nervous system of warm-blooded animals comprising administering to a warm-blooded animal a central nervous system stimulating amount of a compound selected from the group consisting of a compound of the formula

wherein R is selected from the group consisting of
hydrogen,
lower alkyl optionally substituted with hydroxy or halogen,
lower alkenyl,
lower alkynyl,
$-(CH_2)_n-COCH_3$ where *n* is O or 1,

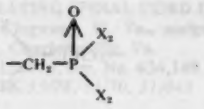
wherein X is selected from the group consisting of lower alkyl, phenyl, nitro-phenyl,
phenylalkyl of 7 to 8 carbon atoms,
acyl of a saturated aliphatic mono carboxylic acid of 1 to 6 carbon atoms optionally substituted with



where *m* is an integer from 0 to 6 and X_1 is selected from the group consisting of hydrogen and lower alkyl,



where *p* is an integer from 1 to 6 and X_1 is as before,



wherein X_2 is lower alkyl,
and R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, CF_3- and diloweralkylamino and the non-toxic, pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

4,009,274
CERTAIN 3-PYRIDINECARBONITRILES, DERIVATIVES THEREOF AND ANTI-ULCER COMPOSITIONS CONTAINING SAME

Adrian Charles Ward Curran, North Humberside, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

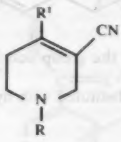
Continuation-in-part of Ser. No. 468,726, May 10, 1974, Pat. No. 3,981,878, which is a continuation-in-part of Ser. No. 299,995, Oct. 24, 1972, Pat. No. 3,845,064. This application Feb. 19, 1976, Ser. No. 659,433

Claims priority, application United Kingdom, Oct. 29, 1971, 50431/71

Int. Cl.² A61K *31/34*; **C07D** *213/57*

U.S. Cl. 424—263 **5 Claims**

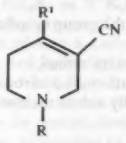
1. An anti-ulcer composition comprising an effective amount of a compound of formula



(I)

wherein R is phenylloweralkyl and R^1 is loweralkyl or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier.

4. A compound of formula



(I)

wherein R is phenylloweralkyl and R^1 is lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

4,009,275
PHENOXYPROPYLAMINE DERIVATIVES

Isamu Maruyama, Minoo; Masaru Nakao; Kikuo Sasajima, both of Toyonaka, Japan; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

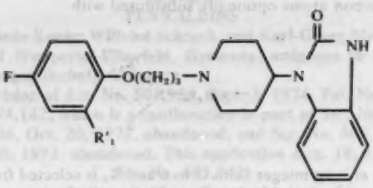
Filed Feb. 28, 1975, Ser. No. 553,932

Claims priority, application Japan, Feb. 28, 1974, 49-24501; May 9, 1974, 49-51921; Oct. 9, 1974, 49-116614

Int. Cl.² C07D *401/04*

U.S. Cl. 424—267 **3 Claims**

1. A phenoxypropylamine derivative of the formula:



wherein R_1' is a chlorine atom or an allyl group, and pharmaceutically acceptable salts thereof.

4,009,276
OXADIAZOLINE DERIVATIVES

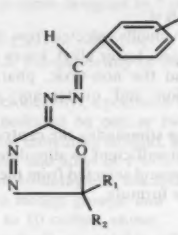
John Warkentin, Burlington; Kottieth Ramakrishnan, Hamilton; Rup C. Jain, and Frank W. Wandelmaier, both of Montreal, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 3, 1975, Ser. No. 628,223

Int. Cl.² C07D *271/06*

U.S. Cl. 424—272 **10 Claims**

1. Benzylidenehydrazono-oxadiazoline compounds of the formula:



wherein R_1 and R_2 are both lower alkyl or form with the heterocyclic ring carbon-atom, a cyclopentyl or cyclohexyl ring; and R_3 when present is selected from halogen, lower alkyl and lower alkoxy.

4,009,277
1,2-DIALKYL-3,4,5-TRISUBSTITUTED PYRAZOLIUM SALTS AS FUNGICIDAL AGENTS

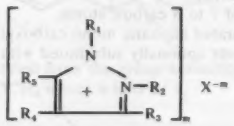
Bryant Leonidas Walworth, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 541,900, Jan. 17, 1975, abandoned. This application July 23, 1975, Ser. No. 598,527

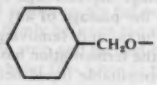
Int. Cl.² A01N *9/22*

U.S. Cl. 424—273 **18 Claims**

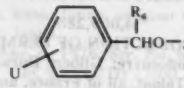
1. A method for protecting living beneficial plants from fungi comprising applying to the foliage of said plants a fungicidally effective amount of a compound having the formula:



wherein R_1 and R_2 each represent C_1-C_3 alkyl or benzyl; R_3 and R_5 each represent a member selected from the group consisting of phenyl, halophenyl and tolyl; R_4 represents a member selected from the group consisting of C_1-C_{16} alkoxy, C_3-C_4 alkenyloxy, C_3-C_4 alkynyloxy, C_3-C_4 haloalkenyloxy,



and



where R_a represents hydrogen or methyl, U represents a member selected from the group consisting of hydrogen, methyl, methoxy, halogen, cyano, trifluoromethyl, nitro and 2,4-dinitro; X represents an anion with a charge of from 1 to 3; and *m* represents an integer from 1 to 3.

4,009,278

ANTIMICROBIAL COMPOSITION AND METHOD CONTAINING N-(3,5-DIHALOPHENYL)-IMIDE COMPOUNDS

Akira Fujinami, Ashiya; Toshiaki Ozaki, Toyonaka; Shigehiro Ooba, Takarazuka; Sigeo Yamamoto, Toyonaka; Katsuji Nodera, Nishinomiya; Katsutoshi Tanaka, Takarazuka; Keiichiro Akiba, Ikeda; Tadashi Ooishi, Minoo, and Nobuyuki Kameda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

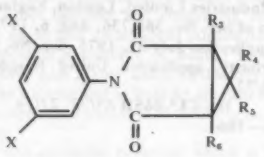
Division of Ser. No. 322,169, Jan. 9, 1973, Pat. No. 3,903,090, which is a division of Ser. No. 17,339, March 6, 1970, Pat. No. 3,745,170. This application Apr. 24, 1975, Ser. No. 571,104

Claims priority, application Japan, Mar. 19, 1969, 44-21529

Int. Cl.² A01N *9/22*

U.S. Cl. 424—274 **9 Claims**

1. A microbiocidal composition containing as an active ingredient an anti-microbiocidally effective amount of an N-(3,5-dihalophenyl)imide compound represented by the formula,



wherein X represents, Cl, Br or I; R_3, R_4 and R_6 each represent hydrogen or methyl; and R_5 represents hydrogen or methyl and a carrier.

4,009,279

METHODS FOR CONTROLLING INSECTS AND ACARINA

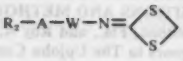
Roger Williams Addor; James Byron Lovell, both of Pennington, and Sidney Kantor, Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 493,944, Aug. 14, 1974, Pat. No. 3,928,382, which is a division of Ser. No. 235,397, March 16, 1972, abandoned. This application Sept. 25, 1975, Ser. No. 616,792

Int. Cl.² A01N *9/00*

U.S. Cl. 424—277 **10 Claims**

1. A method for controlling insects and acarina comprising contacting the ova of said insects and acarina with an ovicidal amount of a compound having the formula:



wherein W is selected from the group consisting of methylene, ethylene, lower alkyl (C_1–C_5) substituted methylene and lower alkyl (C_1–C_5) substituted ethylene; A is oxygen or sulfur; and R_2 is selected from the group consisting of C_1–C_{12} alkyl, monocyclic alkyl (C_3–C_{12}) and bicyclic alkyl (C_5–C_{12}), phenyl, mono and diloweralkyl (C_1–C_4) phenyl, mono and dihalophenyl, furfuryl, tetrahydrofurfuryl, alkenyl of 2 to 8 carbon atoms, and lower alkoxy (C_1–C_4) lower alkyl (C_2–C_3).

4,009,280

POWDER COMPOSITION FOR INHALATION THERAPY

Donald Ross Macarthur, and David Ernest Smith, both of Loughborough, England, assignors to Fisons Limited, London, England

Continuation of Ser. No. 277,233, Aug. 2, 1972, abandoned. This application June 9, 1975, Ser. No. 584,888

Claims priority, application United Kingdom, Aug. 10, 1971, 37456/71

Int. Cl.² A01N *9/28*

U.S. Cl. 424—283 **7 Claims**

1. A powder composition for inhalation therapy which comprises from 10 to 75% by weight of the di-sodium salt of 1,3-bis(2-carboxy-chromon-5-yloxy)propan-2-ol having a mass median diameter in the range of 2.8 to 3.9 microns, and from 90 to 25% by weight of a solid, pharmaceutically acceptable, watersoluble inhalation powder carrier which is chemically inert to the said di-sodium salt which carrier is acceptable in the lungs and has a particle size in the range of from 30 to 150 microns.

4,009,281

FUMIGANT COMPOSITION CONTAINING D-ALLETHRONYL D-TRANS-CHRYSANTHEMATE

Yoshitoshi Okuno, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 459,934, April 11, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,711

Claims priority, application Japan, Apr. 21, 1973, 48-45513

Int. Cl.² A01N *9/24*

U.S. Cl. 424—306 **2 Claims**

1. An insecticidal material consisting essentially of an insecticidally effective amount of d-2-allyl-3-methyl-cyclopent-2-ene-1-one-4-yl d-trans-chrysanthemate absorbed on a fibrous support suitable for use on an electrically heated plate.

4,009,282

TREATMENT OF PROLIFERATING SKIN DISEASES WITH PROSTAGLANDINS

John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 425,099, Dec. 17, 1973, abandoned, and a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,577

Int. Cl.² A61K *31/19, 31/215*

U.S. Cl. 424—317 **6 Claims**

1. A process for teating proliferating skin diseases comprising the administration of an effective amount of PGE_1, PGE_2, PGE_3 or the alkyl ester thereof containing from 1 to 8 carbon atoms, inclusive, or 13,14-dihydro PGE_1 or the alkyl esters thereof containing from 1 to 8 carbon atoms inclusive, in association with a pharmaceutical carrier to a human or animal.

4,009,283
ANTIINFLAMMATORY AND ANTITHROMBOTIC COMPOSITIONS AND METHOD OF USE

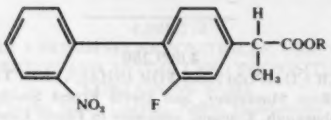
Milton E. Herr, Deltona, Fla., and Roy A. Johnson, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 413,647, Nov. 7, 1973, Pat. No. 3,957,861. This application Feb. 6, 1976, Ser. No. 655,897

Int. Cl.² A61K *31/19, 31/235*

U.S. Cl. 424—317 **12 Claims**

1. A pharmaceutical composition which comprises an anti-inflammatory effective amount of a compound of the formula



wherein R is hydrogen or alkyl of one to six carbon atoms, inclusive, in association with a pharmaceutical carrier.

4,009,284
GASTROINTESTINALLY ACTIVE THIOUREAS

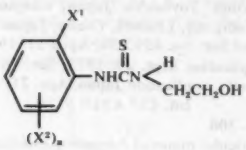
Peter L. De Benneville; Jack N. Moss, both of Philadelphia, Pa., and Esam Z. Dajani, Chicago, Ill., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 553,354, Feb. 26, 1975, Pat. No. 3,950,537, which is a continuation-in-part of Ser. No. 374,852, June 29, 1973, abandoned, which is a division of Ser. No. 175,373, Aug. 26, 1971, abandoned. This application Dec. 3, 1975, Ser. No. 637,241

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **6 Claims**

1. A method for treating a mammal suffering from ggastrointestinal disturbances which comprises administering to said mammal in an amount effective to reduce gastric secretions, a compound of the formula:



wherein X^1 is methyl or ethyl; X^2 is 3,4 or 6-methyl; 3,4 or 5-cnloro or bromo and *n* is an integer of 0–2.

4,009,285
METHOD FOR PRODUCING CHAMPAGNE

James E. Spooner, 3260 A 46th St., Los Alamos, N. Mex. 87544

Filed Sept. 6, 1973, Ser. No. 394,742

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C12G *1/06*

U.S. Cl. 426—8 **3 Claims**

1. A fermentation process for producing champagne which comprises placing a fermentable liquid in a pressure sealable receptacle and introducing in said receptacle a yeast held within a container having a porous wall membrane, said container being out of contact with said liquid, causing said fermentable liquid to contact the contained yeast and thereby causing fermentation to take place, said porous wall membrane having openings of a mean pore size sufficient to retain the yeast cells having a diameter greater than the pores in the membrane while permitting the interchange of the liquid components and passage therethrough in the membrane and small enough to bar the passage of any solid yeast and solid fermentation byproducts, and removing the container and retained solids after the fermentation has been effected to the desired stage, the fermentable liquid being a wine and sugar solution, and a secondary fermentation process being carried out under secondary fermentation conditions of temperature and for a period of time sufficient to produce champagne.

4,009,286
CONTINUOUS PRODUCTION OF FERMENTED LIQUIDS

Manfred Moll, Vandoeuvre; Gilbert Durand, Toulouse, and Henri Blachere, Talant, all of France, assignors to Groupement d'Interet Economique, France

Filed July 1, 1974, Ser. No. 484,868

Claims priority, application France, Oct. 19, 1973, 73.38385

Int. Cl.² C12C *11/04, 11/12, 11/14*

U.S. Cl. 426—13 **13 Claims**

1. A process for the continuous production of a fermented liquid wherein all constituents participating in said production are sterilized prior to being introduced into said process comprising the steps of flash sterilizing a mixture of wort and bitter substances by direct injection of steam into said mixture, boiling said mixture so as to complete the transformation of the bitter substances incorporated in said wort, decanting the precipitates formed in said wort under aeration of said wort by sterile compressed air or oxygen, fermenting said wort by bringing said wort into contact with yeast fed from an external supply in sterile condition, said yeast being fixed on an inert support by physical-chemical bonds, storing the fermented wort in the presence of yeast under sterile conditions and passing said fermented wort through a treatment zone in contact wit sterile protease fixed on a support, all steps of said process being carried out in zones provided with means for avoiding the introduction of foreign microorganism therein so that a permanently sterile medium is provided throughout said process.

4,009,287
CONTAINERS FOR PACKAGING LIQUIDS

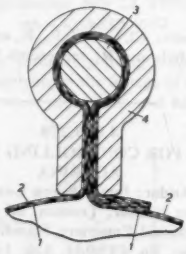
Kenneth Clarke, Knebworth, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 385,736, Aug. 6, 1973, abandoned. This application July 31, 1975, Ser. No. 600,801

Claims priority, application United Kingdom, Aug. 24, 1972, 39413/72

Int. Cl.² B65D *85/72, 77/14*

U.S. Cl. 426—106 **10 Claims**



1. A package containing a carbonated beverage at superatmospheric pressure and made from a length of flexible tubular thermoplastics film sealed at each end by a gas-tight enclosure such that the greater the internal pressure in the container the greater is the sealing pressure upon the film within the enclosure, said gas-tight closure includes a flattened end of the tubular film folded transversely through 180° around a rod

and a strip of malleable material of U-shape cross-section crimped over the folded film along the fold around the rod and enclosing tightly and continuously the turned over end of the film and clamping it firmly between the rod and the malleable strip, the length of the strip and the rod being at least as great as the width of the tubular film when in the lay-flat condition.

4,009,288

METHOD OF PREPARING INSTANT WONTONS CONTAINING A FILLER

Kiyoshi Fukagawa, Hino, Japan, assignor to Toyo Suisan Kaisha Ltd., Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,180
Int. Cl.² A21D *13/00*
U.S. Cl. 426—297 **7 Claims**

1. A method of producing instant wontons containing a filler which comprises the steps of preparing raw wontons consisting of a filler wrapped in a skin of dough consisting mainly of wheat flour and containing 28 to 33% by weight of water; preliminarily frying the raw wontons in oil heated to a temperature ranging between 105° and 120° C for a predetermined period sufficient to reduce the water content of the skin of the raw wontons thus fried to 16 to 20% by weight; and finally frying the preliminarily fried wontons in oil heated to 125° to 140° C for a predetermined period sufficient to decrease the water content of the skin of the wontons thus fried to 4 to 8% by weight.

4,009,289

METHOD FOR PREVENTING THE FORMATION OF TURBIDITY AND/OR DEPOSITS IN NON-ALCOHOLIC BEVERAGES CONTAINING SUCROSE AND CONCENTRATES FOR SUCH BEVERAGES

Robert Roos, Amsterdam, and Peter J. Kühn, Bussum, both of Netherlands, assignors to Naarden International, N.V., Naarden, Netherlands

Continuation of Ser. No. 441,343, Feb. 11, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,721
Claims priority, application Netherlands, Feb. 12, 1973, 7301958
Int. Cl.² A23L *2/00*
U.S. Cl. 426—330.3 **13 Claims**

1. A method for preventing the formation of turbidity and/or deposits in clear non-alcoholic beverages which are free of floccules and other deposits and containing sucrose as the main sweeting agent and clear liquid concentrates for these beverages, consisting essentially of adding thereto at most 0.25% by weight of gum arabic, calculated as dry substance on the weight of the sucrose and at least an amount of gum arabic sufficient to prevent the formation of turbidity and/or deposits in said beverage.

12. A clear non-alcoholic beverage which is free of floccules and other deposits and containing sucrose as the main sweetening agent or a clear liquid concentrate for such a beverage, consisting essentially of at most 0.25% by weight of gum arabic, calculated as a dry substance on the weight of the sucrose present and at least an amount of gum arabic sufficient to prevent the formation of turbidity and/or deposits in said beverage.

4,009,290

METHOD FOR PREPARING EDIBLE OIL

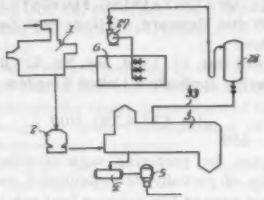
Toshio Okumori, Sagamihara; Yozo Tadokoro, Yokohama; Yoshiyuki Takagi, Yokohama, and Nobuo Yoshida, Yokohama, all of Japan, assignors to Nisshin Seiyu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 441,497, Feb. 11, 1974, abandoned. This application Apr. 6, 1976, Ser. No. 674,121
Int. Cl.² C11B *1/06, 1/10*
U.S. Cl. 426—489 **6 Claims**

1. A process of extracting oil from vegetable seeds comprising the steps of

mechanically expelling crude oil from the vegetable seeds to produce vegetable seed cakes and mechanically expelled crude oil,

separating the mechanically expelled crude oil from the cakes,



passing the separated mechanically expelled crude oil through a layer of the separated cakes produced in the expelling step to filter sediment from the mechanically expelled crude oil, and

chemically extracting crude oil from the cakes after said passing step is performed by flowing a solvent through the layer of cakes.

4,009,291

COLD WATER SOLUBLE STABLE BULKED STARCH

William A. Mitchell, Lincoln Park, N.J.; William C. Seidel, Monsey, and George E. Orozovich, Flushing, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,055
Int. Cl.² A23L *1/195*
U.S. Cl. 426—548 **16 Claims**

1. A process for producing a starch having the cold water solubility, low-hazing low viscosity and film-forming properties of a dextrin comprising:

a. selecting a water insoluble granule starch having been hydrolyzed to a degree such that the starch has little or no reducing sugars present, has a DE of less than about 1 and when heated above a temperature of about 65° C, forms a clear, low viscosity solution;

b. gelatinizing the modified granule starch without modification of the starch molecule; and

c. drying the starch, the resultant starch material demonstrating a bland taste, low-hygroscopicity, low bulk density, low viscosity and film-forming properties in addition to the ability to both produce clear solutions and hold at higher levels numerous types of food materials.

4,009,292

EFFERVESCENT DIPEPTIDE SWEETENER TABLETS

Thomas P. Finucane, Hartsdale, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,416
Int. Cl.² A23L *1/236*
U.S. Cl. 426—548 **14 Claims**

9. A process for producing an effervescent dipeptide sweetener tablet which is readily soluble and has enhanced sweetness and stability which comprises combining a soluble form of a dipeptide sweetener, formed by homogenizing a slurry of hydrolyzed cereal solids and a dipeptide sweetener and drying, with a stable dry carbonation system containing calcium carbonate, said calcium carbonate present in an amount sufficient to give a total calcium ion concentration in a fluid beverage of less than 0.10% such that the volume of CO_2 gas released per volume of the final liquid beverage is appreciably less than 1, and consequently not sufficient to lend a carbonated property to the beverage, and anhydrous citric acid, the amount of sweetener present being effective to impart sweetness to the tablet, the amount of dry caroonation system present being effective to increase the solubility of the dipeptide sweetener without imparting an off taste to the resultant

tablet; and the amount of anhydrous citric acid present being effective to react with the calcium carbonate.

4,009,293

SUGAR CONTAINING FOODSTUFFS

Lionel Alan Walter Hayward, 40 Hyde Park Square, London, W.2., England

Filed Dec. 27, 1974, Ser. No. 537,013

Claims priority, application United Kingdom, Jan. 7, 1974, 580/74

Int. Cl.² A23G *3/00*

U.S. Cl. 426—659 **8 Claims**

1. A process for preparing sugar-containing foodstuffs which consists of partially de-proteinating and evaporating raw cane sugar juice or raw aqueous beet sugar extract under such conditions wherein no other components except protein present in the cane sugar juice or aqueous beet extract are removed from the solution to produce an unrefined sugar-containing syrup and incorporating the syrup so-produced directly into a foodstuff.

4,009,294

PROCESS OF PREPARING FIRE-RETARDANT NATURAL AND SYNTHETIC FIBERS

James C. W. Chien, Amherst, Mass., and Frederick George Schappell, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 541,182, Jan. 15, 1975, Pat. No. 3,957,835. This application Apr. 18, 1975, Ser. No. 569,251

Int. Cl.² B05D *3/06*

U.S. Cl. 427—35 **21 Claims**

1. The process of preparing fire-retardant natural and synthetic fibers and films comprising contacting the fiber or film with a brominated azido fire-retardant having the formula

$$(Br)_z—R—[(R')_n—A]_y$$

where R is selected from alkylene, polyalkylene, cycloalkylene, alkylene cycloalkylene, arylene, alkylene arylene, poly(alkenyl arylene), alkylene-oxy-alkylene, poly(alkylene oxide), alkylene-oxy-arylene, alkylene-oxy-cycloalkylene, cycloalkylene-oxy-cycloalkylene, poly(cycloalkylene oxide), cycloalkylene-oxy-arylene, arylene-oxy-arylene, poly(arylene oxide), arylene carboalkoxy, alkylene carboaryloxy, alkyl alkylene carboxylate, aryl alkylene carboxylate, alkylene carbonyl alkylene, alkylene carbonyl arylene, cycloalkylene carbonyl cycloalkylene and arylene carbonyl arylene radicals, where the alkyl and alkylene groups contain 1 to 18 carbon atoms; R' is selected from

$$—\overset{O}{\overset{\|}{C}}—O—R''—,\quad —O—\overset{O}{\overset{\|}{C}}—R''—,\quad —O(R''—O)_b—R''—,$$

$$—O—\overset{O}{\overset{\|}{C}}—NH—R''—,\text{ and }—\overset{O}{\overset{\|}{C}}—NH—R''—$$

where R'' is selected from alkylene, cycloalkylene, alkylene cycloalkylene, arylene, alkylene arylene, and the foregoing radicals with bromo substituents, where the alkylene groups contain 1 to 20 carbon atoms, and *b* is an integer from 1 to 10; A is selected from

$$—(O)_z—\overset{O}{\overset{\|}{C}}N_3$$

and $—SO_2N_3$ where *z* is 0 or 1; *x* is at least 3; *n* is 0 or 1; and *y* is an integer from 1 to 100; and initiating a rection of the fire-retardant with the fiber or film by irradiation at a wavelength of from about 2,000 A to about 4,000 A.

4,009,295

PRINTABLE ANTI-BLOCKING RESINOUS BLOCK COPOLYMER

John H. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 460,936, April 15, 1974, Pat. No. 3,896,068. This application Feb. 3, 1975, Ser. No. 546,818

Int. Cl.² B05D *3/06*

U.S. Cl. 427—40 **4 Claims**

1. A process for forming a coated substrate comprising forming a shaped substrate made of a resinous block copolymer of a monovinyl-substituted aromatic compound and a conjugated diene containing 0.1 to 20 weight percent based on the weight of said block copolymer of an anti-block agent and 0.1 to 1 weight percent based on the weight of said block copolymer of a normally solid olefin polymer having a crystallinity of at least 40 percent, thereafter subjecting at least one surface of said shaped substrate to a pretreatment selected from flame treatment, acid treatment, or corona discharge, and thereafter applying a coating selected from the group consisting of lacquer, enamel, and ink to said substrate.

4,009,296

METHOD FOR PRODUCING THE INSULATION OF A CONDUCTOR BUNDLE

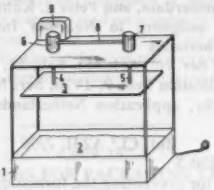
Georg Löb, and Clemens Pfohler, both of Eberbach, Germany, assignors to Brown, Boveri & Cie. A.G., Mannheim, Germany

Filed Mar. 10, 1975, Ser. No. 556,925

Claims priority, application Germany, Mar. 12, 1974, 7408585[U]

Int. Cl.² H01B *13/00;* **C09J** *5/00*

U.S. Cl. 427—54 **9 Claims**



1. Method of producing the insulation of a conductor bundle having a plurality of flat metallic conductors spaced one from another which comprises immersing the conductor bundle of mutually spaced-apart uninsulated flat metallic conductors through an unobstructed path into a mass of insulating material heated to liquid state, and withdrawing the conductor bundle with each of the flat metallic conductors thereof coated at least partly with liquid insulating material through an unobstructed path out of the mass of liquid insulating material at a speed that is slower than the speed at which the liquid insulating mass drips from the conductor bundle.

4,009,297

GOLD DEPOSITION PROCEDURES AND SUBSTRATES UPON WHICH GOLD HAS BEEN DEPOSITED

John Peter Redmond, Mechanicsburg; Daniel Marshall Andrews, and Karl Edward Guyler, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1974, Ser. No. 553,047

Int. Cl.² B05D *3/06;* **C23C** *11/02*

U.S. Cl. 427—54 **33 Claims**

1. A process for depositing on a substrate gold from a solution, the process comprising:

a. introducing into a polar, non-aqueous solvent a ligand of the formula

$$(R_3L)_n\,[Au_y^{+n}]X_m$$

wherein R is at least one of hydrogen, hydrocarbon group, an aliphatic group; cycloaliphatic; an aromatic group; substituted aromatic group, halogeno, or a heterocyclic group; L is phosphorous, arsenic, antimony, sulfur, or nitrogen, Au is replaceable with As or Sb, v is the valance of the Au group, X is an anion of F, Cl, Br, I, Cn, thiocyanate, a nitrate, chlorate, borohydride, or alkyl of 1 to 4 carbons; *m* is the number of anions and is from 1 to 3, *y* is equivalent to *n* or 1 or 2 and *n* is from 1 to 4;

b. adding to the solvent a reducing agent. and

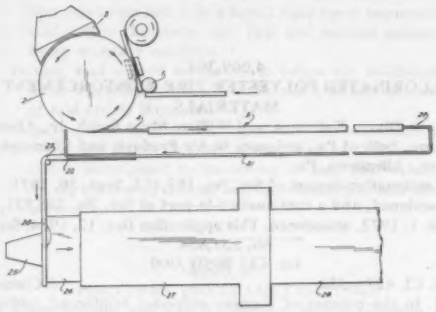
c. introducing into said solvent in the presence of a nucleophile the substrate for depositing gold thereon.

4,009,298

METHOD OF CURING PLASTIC COATINGS ON BOTTLES

Joseph C. Cavanagh, Bay Shore, N.Y., assignor to Midland Glass Company, Inc., Cliffwood, N.J.

Filed Mar. 6, 1975, Ser. No. 555,852
Int. Cl.² B05D *3/06*
U.S. Cl. 427—55 **7 Claims**



1. A process for curing of a plastic coating on a glass container comprising:

a. conveying a glass container, having a coating of uncured plastic at least on its rim portion, said rim portion including its heel portion and the lower portion of its sidewall, supported from the neck portion, through an area where high-intensity heat is applied to the rim portion of the container;

b. conveying said container through an area wherein said heated plastic portion is allowed to cool;

c. transferring said container to a conveyor which supports said container from its heel portion; and

d. conveying said container through an area where cure of the remainder of the plastic coating is accomplished.

4,009,299

TIN STRIP FORMULATION FOR METAL TO GLASS SEAL DIODES

Dervin L. Flowers, and Richard L. Greeson, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 22, 1975, Ser. No. 624,681
Int. Cl.² B05D *5/12;* **B23P** *7/00*
U.S. Cl. 427—82 **3 Claims**

1. A process for the reclamation of semiconductor devices comprising:

providing semiconductor devices having a defective tin plating thereon; and

immersing said devices, for about 5–10 minutes, in a solution of 5–20 percent by weight trichloroacetic acid, 0.1 to 5 percent by weight of a compound selected from the group consisting of cationic, anionic, nonionic surfactants, and the balance water.

4,009,300

PREPARATION OF GRADED COMPOSITION PROTECTIVE COATINGS

John H. Chaffin, III, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 16, 1974, Ser. No. 515,140
Int. Cl.² B05D *1/34;* **G02B** *1/10*
U.S. Cl. 427—162 **11 Claims**

1. In a method of vapor depositing an optical coating which is an alloy of at least a first and a second halide compound material, and wherein the vapor temperature of the first material is high enough to cause decomposition of the second material, the improvement comprising:

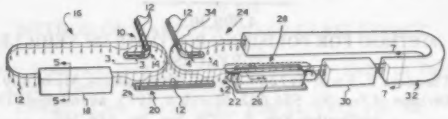
vapor depositing the first and second materials in the presence of a third vapor which does not chemically react or co-deposit with the first and second materials; wherein the third vapor is present in an amount sufficient to cause, as a result of collisions between the vapor of the first material and the third vapor, a reduction in the vapor temperature of the first material to a temperature which will not cause substantial decomposition of the second material.

4,009,301

METHOD FOR POWDER COATING

Russell W. Heckman, Perrysburg; Joseph S. Koluch, Northwood, and Roger R. Rhoads, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 5, 1974, Ser. No. 503,321
Int. Cl.² B44D *1/094*
U.S. Cl. 427—195 **5 Claims**



1. The method of coating at least a selected portion of the external peripheral surface area of containers with an organic polymeric material in powdered form which comprises the steps of:

conveying the containers through a preheating zone, for increasing the temperature of said containers to a temperature of at least 150° F., in an upright position grasped at their upper end by chucks carried by a first chuck carrying conveyor;

completely releasing said containers from said first chuck carrying conveyor and simultaneously therewith;

depositing said heated containers on a moving transfer conveyor at an unloading zone;

transporting said heated containers in a spacedapart single file on said transfer conveyor to a loading zone remote from said unloading zone;

moving the chucks of a second chuck carrying conveyor into general registry with said loading zone;

grasping, at said loading zone, each of the preheated containers with a chuck, substantially lower in temperature than the container temperature, of said second chuck carrying conveyor;

removing said containers from said transfer conveyor by the continued movement of said second chuck carrying conveyor;

conveying the preheated containers through a powder spraying apparatus;

spraying said powdered organic polymeric material onto the selected portion of said preheated containers during their movement through said spraying apparatus; and

thereafter curing said sprayed organic polymeric material on said containers so as to produce a film-like organic polymeric layer overlying said selected portion thereof.

4,009,302

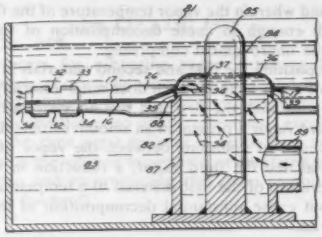
METHOD OF COATING A GAS RANGE TOP BURNER

William P. Biddle, and John J. Tacker, both of Athens, Tenn., assignors to Athens Stove Works, Inc., Athens, Tenn.

Division of Ser. No. 498,303, Aug. 19, 1974, Pat. No. 3,922,138. This application June 6, 1975, Ser. No. 584,655

Int. Cl.² F24C *3/10*; **C23D** *5/02*

U.S. Cl. 427—238 **5 Claims**



1. A method of applying ceramic frit to a sheet metal burner assembly base plate formed of a pair of joined overlying metal sheets having an integrally embossed air-gas duct formed therebetween, comprising the steps of substantially entirely immersing the joined metal sheets in a slurry of ceramic frit and simultaneously pressurizing a volume of slurry material at the exterior of the sheets whereby ceramic frit particles are forced into crevices existing between the sheets, removing the sheets from the slurry and subsequently firing the frit onto the sheets whereby the said particles driven into the crevices between the sheets are fused to seal said crevices.

4,009,303

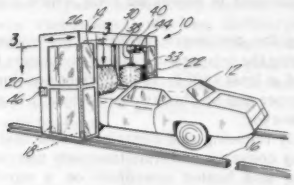
METHOD FOR POLISHING PORTIONS OF VEHICLE SURFACES

Theodore P. Faris, 21720 Corsaut, Birmingham, Mich. 48010

Division of Ser. No. 556,002, March 6, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,750

Int. Cl.² B60S *3/06*

U.S. Cl. 427—287 **1 Claim**



1. A method of polishing a vehicle having windows within an apparatus of the type having a pair of longitudinally disposed tracks spaced apart a sufficient distance to define an area in which the vehicle may be positioned; a carriage having a pair of upright members respectively movably mounted on said tracks and an overhead member connecting said upright members to define an opening thereinbetween of sufficient size to permit the carriage to pass over the vehicle disposed in said area; means for reciprocally moving said carriage on said tracks longitudinally at a selected speed; first rotating brushes carried by said upright members and displaceable relative to the vertical exterior surface of the vehicle disposed in said area; a second rotating overhead brush carried by said carriage and displaceable relative to the upper exterior surface of a vehicle disposed in said area; and means displacing said rotating first and second brushes into contact with the vertical and upper exterior surfaces of the vehicle as said carriage is reciprocally moved relative to the vehicle disposed in said area;

said method comprising the steps of:

a. manually applying polish to selected portions of at least one exterior surface of the vehicle which is desired to be polished and not applying wax to the windows of the vehicle;

b. permitting the polish to dry for a selected period of time;

c. positioning the vehicle in the area defined between the longitudinally disposed tracks;

d. selecting the speed at which said carriage will reciprocate on said tracks;

e. passing the carriage back and forth along said vehicle such that said rotating brushes simultaneously contact the vertical and upper exterior surfaces of the vehicle while the vehicle is in a stationary position, the rotating brushes being passed front to rear and rear to front of the vehicle to polish said one exterior surface;

f. terminating said reciprocating movement of said carriage and terminating the contact of the brushes with the vehicle exterior surfaces after said one exterior surface has been polished; and

g. removing said polished vehicle from said area.

4,009,304

FLUORINATED POLYESTER TIRE REINFORCEMENT MATERIALS

Dale D. Dixon, Kutztown, and William Mayo Smith, Jr., Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 185,412, Sept. 30, 1971, abandoned, and a continuation-in-part of Ser. No. 285,831, Sept. 1, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 531,854

Int. Cl.² B05D *3/00*

U.S. Cl. 427—322 **5 Claims**

1. In the process of forming polyester reinforced rubber goods, the improvement which comprises subjecting the polyester reinforcement material to a fluorine containing gas having less than about 5% by volume of elemental oxygen, and from 0.01-2.0% by volume of elemental fluorine for a treatment time of less than 2 minutes and recovering a material having a surface fluorinated from about 4×10^{-6} to 1×10^{-3} mg. F/cm.² and having at least 90% of the tensile strength of untreated material.

4,009,305

PROCESS FOR THE SURFACE TREATMENT OF CARBON FIBERS

Hiroto Fujimaki, Tokyo; Fumio Kodama, Choufu; Reiho Takabe, Kawasaki; Kiro Asano, Tokyo, and Koji Seguchi, Fuchu, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Dec. 20, 1973, Ser. No. 426,567

Claims priority, application Japan, Dec. 22, 1972, 47-129062; Dec. 22, 1972, 47-129063

Int. Cl.² B05D *5/00*

U.S. Cl. 427—399 **5 Claims**

1. A process for the surface treatment of a carbon fibre which comprises oxidizing the surfaces of said carbon fibre to form oxygen-containing functional groups on said surfaces and then reacting said oxygen-containing functional groups with a compound selected from the group consisting of ammonia, organic amine, lactam and aminocarboxylic acid at a temperature of 100° – 500° C for a time period within the range of 1 minute to 5 hours.

4,009,306
ENCAPSULATION METHOD

Kazuo Yamashita, Kawanishi; Yoshikazu Yokose, Takarazuka; Masatake Akao, Katano, and Takashi Shibano, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 22, 1975, Ser. No. 615,702

Claims priority, application Japan, Sept. 26, 1974, 49-111273; Sept. 26, 1974, 49-111274; Sept. 26, 1974, 49-111275

Int. Cl.² B05D *1/38, 1/18, 5/12, 3/00*

U.S. Cl. 427—374 C **9 Claims**

1. An article encapsulation method comprising the steps of applying a first substance having thermosetting characteristics and able to provide requisite protection to an article when hardened around and into interior portions of the article to be encapsulated, said first substance being in a precured state during said application, whereby said first substance adheres to and covers surface portions of said article,

immersing said article having said first substance adhering to said surface portions thereof in a second substance which is reversibly transformable from a solid to a liquid state, melts at a temperature which is between the primary curing temperature and final curing temperature of said first substance, is non-reactive with respect to said first substance and is in a liquid state upon immersion of said article thereinto, said first and second substances being mutually insoluble,

cooling said second substance to below the solidification point thereof immediately subsequent to said immersion of said article thereinto,

supplying heat to effect curing of said first substance, and

moving said article out of contact with said second substance subsequent to hardening of said first substance during the curing thereof and after melting of said second substance.

4,009,307
POLYUREA-URETHANE COATINGS

J. Alden Erikson, and Ken W. Niederst, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 24, 1975, Ser. No. 599,242

Int. Cl.² B05D *3/02*

U.S. Cl. 427—377 **28 Claims**

1. A coating composition comprising:

A. from about 2 percent to about 80 percent by weight of resin solids of an isocyanate-terminated polyurethane prepolymer consisting essentially of the reaction product of an organic diisocyanate and an organic diol, wherein said prepolymer is prepared at an NCO/OH ratio of from about 2:1 to about 4:3;

B. from about 2 percent to about 60 percent by weight of resin solids of an isocyanate-terminated polyurethane prepolymer consisting essentially of the reaction product of 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane and a mixture of aliphatic polyols, wherein said prepolymer is prepared at an NCO/OH ratio of at least 1.2:1 and wherein at least about 30 mole percent of the total hydroxyl groups supplied by said mixture of polyols is supplied by an aliphatic polyol having at least three hydroxyl groups; and

C. from about 20 percent to about 50 percent by weight of resin solids of a polyketimine material consisting essentially of the reaction product of a diketimine compound having the general formula:

wherein R is an alkylene group of 2 to 6 carbon atoms and R_1 and R_2 are hydrogen or organic radicals having from 1 to 8 carbon atoms, and a polyisocyanate material selected from the group consisting of an isocyanate-terminated prepolymer formed by reacting an organic diisocyanate and an organic diols at an NCO/OH ratio of from about 2:1 to about 4:3 or a mixture of an isocyanate-terminated prepolymer and unreacted organic diisocyanate formed by reacting an organic diisocyanate and an organic diol at an NCO/OH ratio of from about 3:1 to about 5:1, and wherein a sufficient amount of said diketimine is reacted with said prepolymer or said mixture to produce a polyketimine material containing no free NCO groups.

4,009,308
PROCESS FOR PRODUCING REFRACTORIES

Zenbutsu Tadashi; Asami Hajime, both of Bizen; Uemura Seiichi, Kawasaki, and Hirose Takao, Kamakura, all of Japan, assignors to Shinagawa Refractories Co., Ltd. and Nippon Oil Company Ltd., both of Tokyo, Japan

Filed June 18, 1975, Ser. No. 587,970

Claims priority, application Japan, June 25, 1974, 49-71877

Int. Cl.² C04B *41/04*

U.S. Cl. 427—443 **14 Claims**

1. A process for producing refractories of dolomite- or magnesia-type in which an impregnant is filled into open pores of said refractories, wherein said impregnant is a thermoplastic resinous material which is obtained by removing the light fraction having a boiling point of less than 200° C. under a reduced pressure of 100 mm Hg and having a benzene-insoluble fraction content of less than 10% by weight from at least one member selected from the group consisting of a heavy oil obtained by the steam cracking of petroleum and a polymerization product of said heavy oil.

4,009,309
METHOD OF MAKING STAINED GLASS EFFECT ARTICLES

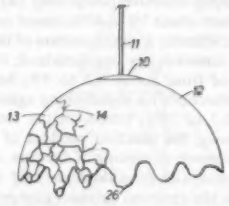
John Frederick Dent Holt, 2 Ariel Court, Ashchurch Park Villas, London W.12, England

Division of Ser. No. 369,858, June 14, 1973, Pat. No. 3,876,483. This application Dec. 10, 1974, Ser. No. 531,295

Claims priority, application United Kingdom, Sept. 26, 1972, 44473/72

Int. Cl.² B44C *5/08;* **B44F** *1/06*

U.S. Cl. 428—38 **3 Claims**



1. A simulated stained glass article comprising as a united structure, in combination:

a. a first rigid preform of translucent material of a shape and size of the finished article having a smooth first surface;

b. a prepatterned colored film on the first surface of the first preform and in register therewith;

c. a second rigid preform of translucent material of a shape and size of said finished article having a smooth first surface located in contact with the film and a second surface with channels formed therein in register with the boundaries of said colored prepattern of the film, the second surface being remote from said film and said channels extending only part-way through the thickness of said second preform;

d. a material in said channels which has a lead-like appearance; and

e. means sealing the free edges of the two preforms to one another.

4,009,310

METHOD OF IMPROVING ADHESION OF SECONDARY BACKINGS ON CARPETS

James Joseph Scobbo, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed July 1, 1976, Ser. No. 701,840
Int. Cl.² D03D 27/00; D04H 11/00
U.S. Cl. 428—95 **12 Claims**

1. The method which comprises coating the backing of a carpet comprising a plurality of fibers or tufts woven with a first fibrous backing with an aqueous curable adhesive composition and then applying with pressure a second fibrous backing material to said adhesive coated first fibrous backing to form a laminate, said adhesive being present in an amount sufficient to secure the ends of said fibers or tufts to said first backing material and to secure said second backing material to said first backing material, said second backing material at the time of application to said adhesive coated first backing material first having been treated with fluid H_2O at a temperature and for a time sufficient to wet said secondary backing, to relax the fibers of said secondary backing, to increase the amount of fibers protruding from the cords or strands of the secondary backing and to improve the penetration of said adhesive into said secondary backing, and then heating the resulting laminate at a temperature and for a time sufficient to dry said adhesive and said secondary backing and to cure said adhesive to bind the ends of the fibers or tufts of said carpet to said primary backing and said primary backing to said secondary backing together into a unitary laminate without adversely affecting the fibers or tufts of said carpet.

4,009,311

STARCH-BASED ALKALINE CURING CORRUGATING ADHESIVES CONTAINING, AS CROSSLINKING AGENT, THE REACTION PRODUCT OF A KETONE, FORMALDEHYDE AND A SECONDARY AMINE

Jules E. Schoenberg, Scotch Plains, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 19, 1975, Ser. No. 578,671
Int. Cl.² B32B 3/28; C08L 3/02
U.S. Cl. 428—182 **15 Claims**

1. A corrugating adhesive comprising (a) starch in a concentration of from about 10 to 40%, based on the total weight of the adhesive, wherein a minor portion of the starch is gelatinized and the remainder is ungelatinized; (b) an alkali in a concentration of from about 0.3 to 4%, based on the total weight of the starch; (c) a crosslinking agent in a concentration of from 0.3 to 10%, based on the total weight of the starch, comprising the reaction product of (i) a ketone selected from the group consisting of acetone, mesityl oxide and diacetone alcohol, (ii) formaldehyde and (iii) a secondary amine, wherein the reaction product comprises 2 to 5 moles formaldehyde and 0.25 to 1 mole secondary amine per mole ketone; and (d) from about 54 to 89% water, based on the total weight of the adhesive.

4,009,312

HEAT-ADHESIVE FILM LAMINATE

Ikuya Hayashi; Keiichi Uno, and Mikio Matsuoka, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1974, Ser. No. 435,925
Claims priority, application Japan, Feb. 2, 1973, 48-13957
Int. Cl.² B32B 15/08, 27/36, 27/28
U.S. Cl. 428—213 **12 Claims**

1. A heat-adhesive film laminate consisting essentially of (A) a plastic film having excellent heat resistance and a melting point of 200° C or more made from a polyester, polyamide or polycarbonate which is in the form of a non-oriented film, a uniaxially oriented film or a biaxially oriented film, said plastic film being laminated on one side of (B) a metal foil, and (C) a film of a resin comprising predominantly block copolyester selected from the group consisting of polyethylene terephthalate/polytetramethylene oxide block copolymer, polytetramethylene terephthalate/polytetramethylene oxide block copolymer, polyethylene terephthalate.isophthalate/polytetramethylene oxide block copolymer and polytetramethylene terephthalate.isophthalate/polytetramethylene oxide block copolyester having a melting point higher than 140° C. but at least 20° C. lower than the melting point of the plastic film and a Young's modulus ϵ (dyne/cm²) and a breaking elongation ($\Delta l/lo$) × 100 (%) when measured at 20° C and 100° C being respectively

$$10^7 \text{ (dyne/cm}^2\text{)} < \epsilon < 10^{10} \text{ (dyne/ cm}^2\text{) and}$$

$$(\Delta l/lo) \times 100 > 40(\%),$$

said film of resin being laminated on the other side of the metal foil.

4,009,313

ENZYMATICALLY DISPERSIBLE NON-WOVEN WEBS

George H. Crawford, Dellwood; Charles F. Nawrot, Eau Claire, and Ronald F. Ofstead, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1972, Ser. No. 285,084
Int. Cl.² B32B 27/04, 27/10
U.S. Cl. 428—290 **17 Claims**

1. A self-supporting, non-woven composite fibrous web which is readily dispersible in aqueous milieu containing enzyme, consisting essentially of a non-woven web of relatively short fibers having surfaces which confer only low wet-strength upon the web in the absence of a binder and in combination therewith a water-insoluble, normally solid, enzyme-disintegratable binder which consists of the reaction product of a polymer containing at least one ethylenically unsaturated monomer covalently bonded with a naturally occurring, enzyme-degradable, water-soluble polymeric material, said binder being present in effective amount ranging from about 0.3 percent to about equal amount by weight of said fibers in said non-woven web, sufficient to impart to said non-woven web wet-strength in the absence of enzyme of from about 0.5 to 10 kg/cm² and resistance to dispersion in water for at least 30 minutes, and to permit dispersion of said non-woven web in a period ranging from about 5 to 30 minutes in aqueous milieu containing enzyme capable of degrading said water-soluble polymeric material to disintegrate said binder and thereby to render said web dispersible.

4,009,314

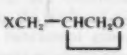
COLORED GLASS FIBER ARTICLES AND PROCESS

Arthur L. Allewelt, West Chester, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 21, 1975, Ser. No. 624,360
Int. Cl.² B32B 27/04, 27/20
U.S. Cl. 428—290 **18 Claims**

1. A glass fiber article treated with a coloring composition comprising a pigment and a polymeric binder, the amount of polymeric binder being effective to adhere the pigment to the article, said polymeric binder being selected from:

A. homopolymers and copolymers of a quaternary monomer prepared by reacting an epihalohydrin of the formula



with an amine salt of the formula $H_2C{=}C(R)C(O)O{-}A{-}N(CH_3)_2{\cdot}HY$; and

B. the reaction product of homopolymers or copolymers of said amine salt and said epihalohydrin;

wherein R is hydrogen or methyl, X is iodine, bromine or chlorine, A is a (C_2–C_8) alkylene group having at least two carbon atoms in a chain between adjoined O and N atoms or A may be a polyoxyethylene group of the formula $(CH_2CH_2O)_xCH_2CH_2$ wherein x is at least 1, and Y is an anion.

4,009,315

CHEMICAL COMPOSITIONS AND PROCESS

Lawrence W. Healy, Johnsonville, S.C.; Wu Lan Wang, Newark, N.J., and Tsu-Huai Wang, Wilmington, Del., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation of Ser. No. 366,158, June 1, 1973, which is a continuation of Ser. No. 180,123, Sept. 13, 1971, which is a continuation of Ser. No. 68,010, Aug. 28, 1970, Pat. No. 3,665,471, which is a continuation-in-part of Ser. No. 562,532, July 5, 1966, abandoned. This application Feb. 3, 1975, Ser. No. 546,503

Int. Cl.² B32B *3/26*

U.S. Cl. 428—310 5 Claims

1. A compressed, breathable, supple, fibrous sheet suitable as a replacement for natural leather wherein the composition of said sheet comprises an integral three-component system containing, by weight based on the total weight, from about 5% to 55% of synthetic organic or natural fibers from about 5% to 60% of flexible polyurethane foam, and from about 25% to 75% of a soft, resilient elastomeric filler; said fibers being of a denier of about 0.5 to 6 and at least one-half inch long; the fibers being needled into the foam and together with said foam comprising an interlocking network having void spaces therebetween, the fibers being distributed throughout the whole cross-section thereof; the filler being dispersed throughout said network and substantially but not completely filling said void spaces, the fibers being capable of restricted movement within said network.

4,009,316

SOIL HIDING, SOIL RESISTANT FIBER COMPRISING A RELATIVELY MAJOR AMOUNT OF A POLYAMIDE COMPONENT AND A MINOR AMOUNT OF AN ACRYLATE POLYMER COMPONENT

W. Hunter Wanger, Southhampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 242,822, April 10, 1972, abandoned. This application Dec. 4, 1972, Ser. No. 312,156

Int. Cl.² B32B *27/02*; C08L *77/00*; D01D *5/12*; D02G *3/00*

U.S. Cl. 428—364 6 Claims

1. An opaque, cold drawn fiber comprising a melt-blend mixture of a nylon component and a second component, said components being present in the fiber in a weight ratio of from 97:3 to 70:30, said second component consisting essentially of a polymethacrylate, an acrylate-methacrylate copolymer or a methacrylic acidmethacrylate copolymer, said second component being thermally stable under fiber forming conditions and having a glass transition temperature substantially above that of the nylon component, said fiber characterized by a specific gravity less than that of the nylon component and a soil hiding ability substantially improved over that of fibers formed from the nylon component alone.

4,009,317

GLASS FIBER COATED WITH A SIZE COMPRISING EMULSIFIED CLAD PARTICLES OF POLY(METHYL METHACRYLATE)

Kenneth P. Chase; Harold L. Haynes, both of Newark, and Michael G. Roberts, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 14, 1973, Ser. No. 415,590

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B32B *17/02*; C08L *23/02*

U.S. Cl. 428—378 18 Claims

1. Glass fibers coated with an aqueous dispersion containing emulsified clad particles of a film former which clad particles have a core that consists of poly alkyl methacrylate and containing at least 5% by weight of methyl methacrylate, and an outer shell of a film forming polymeric material having a Tg of approximately 10°C or less.

8. Glass fibers having a coating thereon comprising the following solids in approximate percentages by weight:

Emulsified clad particles having a core consisting solely of a poly alkyl methacrylate material of which at least 5% is methyl methacrylate	20–70
Additional film former	0–40
Cationic lubricant	2–5
Nonionic lubricant	3–70
Humectant	0–7

said clad particles having an outer shell of a film forming polymeric material having a Tg of approximately 10°C or less.

4,009,318

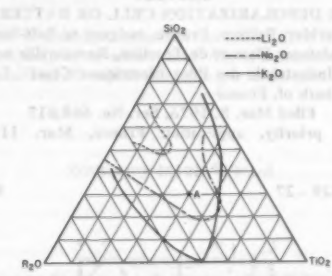
LAMINATED GLASS BODY WITH OPAL PHASE PRODUCED BETWEEN LAMINAE

Thomas H. Elmer, Corning; Arthur E. Hillman, Elmira; Karl E. Hoekstra; Robert G. Howell, both of Corning; Herbert E. Rauscher, Painted Post, and Charles C. Smith, Jr., Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 15, 1974, Ser. No. 523,959

Int. Cl.² B32B *7/04*, *17/06*

U.S. Cl. 428—420 14 Claims



1. A laminated glass article consisting of a base glass lamina and a lamina selected from the group consisting of a source glass lamina and a sink glass lamina with an in situ layer of opalization at the interface between said laminae, said base glass being selected from the group of composition fields, expressed in weight percent on the oxide basis:

a. 2.5–25% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O, 2.5–45% RO, wherein RO consists of CaO, SrO, and BaO and 50–85% SiO_2, the sum of alkali metal oxide + RO + SiO_2 constituting at least 80% of the total composition;

b. 5–70% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O, 5–55% TiO_2, and 20–70% SiO_2, the sum of alkali metal oxide + TiO_2 + SiO_2 constituting at least 50% of the total composition;

c. 30–60% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O, 10–30% Al_2O_3, and 25–45% SiO_2, the sum of alkali metal oxide + Al_2O_3 + SiO_2 constituting at least 80% of the total composition;

c. 3–15% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O, 30% B_2O_3, 55–80% SiO_2, and 1–15% F, the sum of alkali metal oxide + B_2O_3 + SiO_2 + F constituting at least 80% of the total composition; and

e. 5–25% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O, 3–45% RO, wherein RO consists of MgO, CaO, SrO, and BaO, 45–85% SiO_2, and 0.5–5% F, the sum of alkali metal oxide + RO + SiO_2 + F constituting at least 80% of the total composition;

said source glass being a lithium silicate composition containing at least 1% Li_2O, and said sink glass being an alkali metal-free silicate composition.

4,009,319

REGENERATED CELLULOSE FILM, ALUMINUM FOIL LAMINATES AND METHOD FOR PRODUCING SAME

Warren K. Cline, Brevard, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Mar. 1, 1976, Ser. No. 662,599

Int. Cl.² B32B *27/40, 15/00*

U.S. Cl. 428—424 **4 Claims**

1. A laminated sheet material for use in making heat sealable packages having superior resistance to thermal delamination at crimp seal temperatures above 450° F, comprising a web of regenerated cellulose film that has been softened in the wet gel state with an aqueous softener solution consisting essentially of a lower alkylene polyalkylene glycol and water and thereafter dried to a moisture content of about 4 to 8% based on the weight of the dried cellulose in the film and a web of aluminum foil, said film and foil bonded together exclusively with a polyethylene phthalate ester-urethane adhesive in the absence of any synthetic polymer coating applied to either of the bonding surfaces of said film and said foil other than residual amounts of said softener that might remain on the surface of said film.

4,009,320

AIR DEPOLARIZATION CELL OR BATTERY

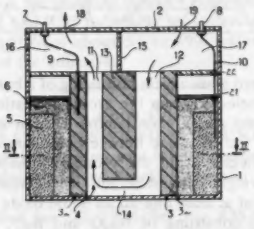
Gerard Gerbier, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville and Compagnie Industrielle des Piles Electriques "Cipel", Levallois-Perret, both of, France

Filed Mar. 8, 1976, Ser. No. 664,817

Claims priority, application France, Mar. 11, 1975, 75.07550

Int. Cl.² H01M *4/06, 8/00*

U.S. Cl. 429—27 **8 Claims**



1. Air depolarization cell comprising a negative electrode, an electrolyte and a positive electrode having at least one cavity via which it is fed with air, characterized in that the said cavity comprises at least two funnels formed directly in the mass of the positive electrode and extending substantially from top to bottom of the said positive electrode, each funnel communicating with the outside air at its upper part, said funnels being separated from each other by a portion of the mass of the positive electrode, and a passageway for said funnels formed directly in the mass of said positive electrode and communicating with each other at their lower parts, the respective ratio between the area of the surface over which air flows through each funnel of the electrode and the volumes of air therein being different for the two funnels.

4,009,321

HIGH TEMPERATURE FUEL CELL ELECTROLYTE

Bernard S. Baker, Chicago, and Leonard G. Marianowski, South Holland, both of Ill., assignors to American Gas Association, Inc., Arlington, Va.

Continuation of Ser. No. 811,675, March 28, 1969, abandoned, which is a continuation of Ser. No. 506,844, Nov. 8, 1965, abandoned. This application Dec. 20, 1972, Ser. No. 316,983

Int. Cl.² H01M *8/14*

U.S. Cl. 429—46 **1 Claim**

1. In an improved high temperature molten carbonate type fuel cell comprising in combination:

a. a fuel chamber to which is fed a fuel mixture,

b. an anode at which said fuel is anodically oxidized by reaction with carbonate ions,

c. a cathode at which oxygen is galvanically reduced and reacted with carbon dioxide to produce carbonate ions,

d. an oxidant chamber to which is fed a mixture of oxygen containing gas and carbon dioxide, and

e. an electrolyte system disposed between said cathode and said anode and containing an electrolyte composition for transfer of carbonate ions from said cathode to said anode,

the improvement of said electrolyte system consisting essentially of:

i. 40 to 70 weight per cent of a ternary alkali metal carbonate mixture wherein said alkali metal is sodium, potassium, and lithium, and

ii. 30 to 60 weight per cent of an inert carrier material consisting of alkali metal aluminates mixture as the only inert material in said electrolyte system, wherein said alkali metal is sodium, potassium and lithium, said inert carrier material being the product of reaction of finely divided, substantially silica-free, reactive alumina having a surface area of greater than about 400 square meters per gram with an excess of said ternary alkali metal carbonates mixture at a temperature above the melting point and below the decomposition temperature of said ternary carbonates mixture, until all of said reactive alumina is converted to said aluminates mixture.

4,009,322

BATTERY COVER FOR FACILITATING THE DRAINING OF LIQUID FROM THE BATTERY WHEN INVERTED

Alby Henry Wolf, Minneapolis, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

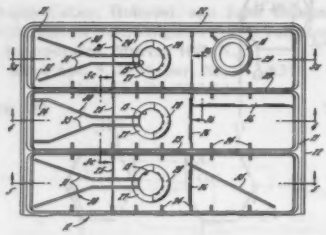
Filed Nov. 17, 1975, Ser. No. 632,352

Int. Cl.² H01M *2/04*

U.S. Cl. 429—175 **8 Claims**

1. A cover for the case of an electric storage battery from which liquid is to be drained comprising, means on the inside of the cover engageable with portions of the case for closing one or more cells, means defining a fill and vent opening extending through the cover into each cell area, each of said vent openings including an annular collar projecting into the cell, and guide means including at least one internal rib on the

inside of the cover within individual cell areas for concentrating and directing liquid over said collar and into the vent



opening when the battery case is inverted and rocked from side to side.

4,009,323

STORAGE BATTERY COMPRISING POSITIVE ELECTRODE OF A GRAPHITE AND LITHIUM FLUORIDE COMPOUND

Douglas N. Bennion, Sepulveda, Calif.; Ranna K. Hebbar, Hightstown, N.J., and Sanjay L. Deshpande, Los Angeles, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,923
Int. Cl.² H01M *43/00*
U.S. Cl. 429—194 3 Claims

1. A sealably-enclosed storage battery system comprising:
a negative electrode, formed of lithium,
a positive electrode formed of a graphite and lithium fluoride compound, and
an electrolyte solution formed of non-aqueous aprotic solvent and a lithium salt.

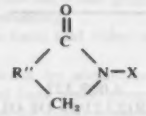
4,009,324

PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING AN N-HALO LACTAM

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 582,507, May 30, 1975, Pat. No. 3,968,095, which is a division of Ser. No. 453,911, March 22, 1974, Pat. No. 3,932,352. This application Apr. 2, 1976, Ser. No. 673,012
Int. Cl.² C08J *3/20*
U.S. Cl. 526—6 2 Claims

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10%, based on the weight of polyolefin, of an additive of the structure



wherein X is chlorine, bromine, or iodine, and R'' is a divalent aliphatic hydrocarbon radical containing 1 to 12 carbon atoms.

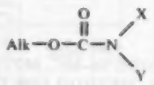
4,009,325

PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING AN N-HALO URETHANE

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 582,507, May 30, 1975, Pat. No. 3,968,095, Division of Ser. No. 453,911, March 22, 1974, Pat. No. 3,932,352. This application Apr. 2, 1976, Ser. No. 672,909
Int. Cl.² C08J *3/20*
U.S. Cl. 526—6 2 Claims

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10%, based on the weight of polyolefin, of an additive of the structure



wherein X is chlorine, bromine, or iodine, Y is hydrogen, chlorine, bromine, or iodine, and Alk is a monovalent aliphatic hydrocarbon radical containing 1 to 18 carbon atoms.

4,009,326

PHOTOCONDUCTIVE POLYMER AND METHOD OF MANUFACTURE

Eugene V. Hort, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed July 31, 1975, Ser. No. 600,889
Int. Cl.² C08F *126/12, 26/12, 226/12*
U.S. Cl. 526—47 7 Claims

1. The process for forming iodinated poly(vinyl carbazole) which comprises reacting a slurry of powdered poly(vinyl carbazole) in an acidic, nonaqueous diluent which is a nonsolvent for the poly(vinyl carbazole) with an alkali metal iodide selected from the group consisting of sodium iodide, potassium iodide and mixtures thereof and an alkali metal iodate selected from the group consisting of potassium iodate, sodium iodate and mixtures thereof, said powdered poly(vinyl carbazole) being prepared by precipitation polymerization and the amount of poly(vinyl carbazole) being regulated to

form iodinated poly(vinyl carbazole) having a mol ratio of iodine to vinyl carbazole of about 0.05 to about 0.9.

4,009,327

POLYMERIZATION OF OLEFINS

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 276,373, July 31, 1972, Pat. No. 3,875,079. This application Dec. 10, 1974, Ser. No. 531,397

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² C08F *4/02, 4/24, 10/00*

U.S. Cl. 526—96 **9 Claims**

1. A method for polymerizing olefins which comprises contacting an olefin-containing stream with a chromium oxide catalyst active for olefin polymerization and comprising a silica-containing composition prepared by:

a. introducing an aqueous lithium silicate solution into an aqueous acid solution to form a hydrogel;

b. aging the hydrogel;

c. washing the hydrogel to reduce the alkali metal content of the hydrogel;

d. contacting the hydrogel with a normally liquid, oxygen-containing, water-soluble organic compound to separate water from said hydrogel and to form a xerogel; and

e. recovering the xerogel as the silica-containing composition.

4,009,328

AMINOGLYCOSIDE 66-40C, METHOD FOR ITS MANUFACTURE, METHOD FOR ITS USE AS AN INTERMEDIATE IN THE PREPARATION OF KNOWN ANTIBIOTICS AND NOVEL ANTIBACTERIALS

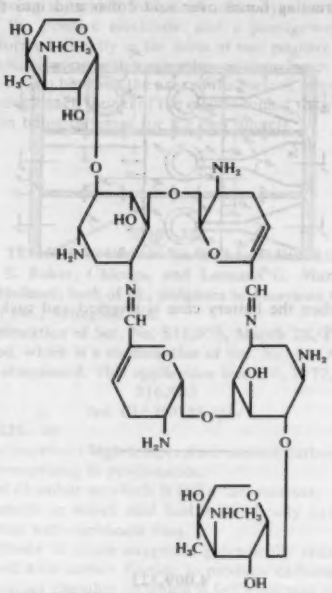
Alan K. Mallams, West Orange, Richard W. Tkach, Linden, both of N.J., and David Huw Davies, Macclesfield, England; assignors to Schering Corporation, Kenilworth, N.J.

Filed May 2, 1975, Ser. No. 574,073

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **11 Claims**

1. Aminoglycoside 66-40C, having the following structural formula:



and being free of substances co-produced therewith.

4,009,329

BIORESISTANT CELLULOSE ETHERS

William Charles Arney; Clarence Alfred Williams, both of St. Albans, and Joseph Edward Glass, Jr., Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 14, 1975, Ser. No. 631,944

Int. Cl.² C08B *11/00, 11/08*

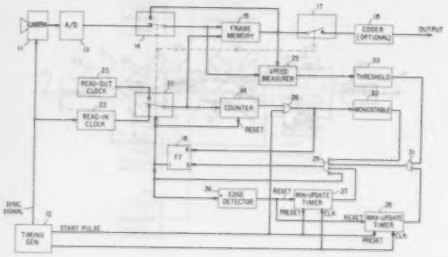
U.S. Cl. 536—84 **11 Claims**

1. In the method of preparing cellulose ethers by contacting the unsubstituted anhydroglucose units of cellulose with one or more etherification agents in the presence of a catalyst, the improvement which comprises using a mixture of sodium and lithium hydroxides as the catalyst with a weight ratio of total hydroxide:cellulose of about 0.1 to about 0.8 and a weight ratio of lithium hydroxide:sodium hydroxide of about 0.1 to about 10, whereby a cellulose ether which is resistant to enzyme catalyzed hydrolysis is obtained.

4,009,330
CIRCUIT FOR SELECTING FRAMES INDICATIVE OF STILL PICTURES

Cassius Chapin Cutler, Holmdel, and John Ormond Limb, Tinton Falls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1976, Ser. No. 673,631
Int. Cl.² H04N *7/12*
U.S. Cl. 358—83 **7 Claims**



1. In combination,

a signal source for supplying successive frames of a video signal including frames indicative of still objects and frames indicative of moving objects;

storing means for retaining a frame of video signals;

speed measuring means in circuit relationship with said storing means for determining the speed of movement between successive frames to indicate frames indicative of still objects,

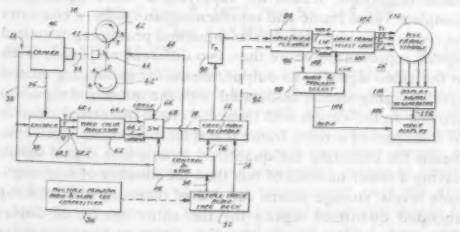
switching means responsive to said speed measuring means in circuit relationship with said storing means, said switching means controlling the application of the video signal to said storing means and completing an output signal path from said storing means, and

said switching means and storing means cooperating by retaining frames indicative of still objects from the succession of frames for application to said output signal path and discarding frames indicative of moving objects.

4,009,331
STILL PICTURE PROGRAM VIDEO RECORDING COMPOSING AND PLAYBACK METHOD AND SYSTEM

Peter C. Goldmark, Stamford; Donald T. Dolan, Ridgefield; Arvind C. Desai, Stamford, and John M. Hollywood, Old Greenwich, all of Conn., assignors to Goldmark Communications Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 536,189, Dec. 24, 1974, abandoned. This application June 6, 1975, Ser. No. 584,624
Int. Cl.² H04N *5/78*
U.S. Cl. 358—127 **39 Claims**



1. A system for producing a video recording of a plurality of video programs formed of still pictures with associated audio comprising

audio composing means for producing a magnetic audio recording of a plurality of audio programs of individually determined duration with identifiable cue signals located to indicate when still pictures related to the audio programs are to be displayed;

means for playing back the audio programs and cue signals from the audio recording;

a video recorder to form said video recording on a video storage medium;

audio recording means for simultaneously recording the plurality of played back audio programs on respectively separate tracks on the video storage medium;

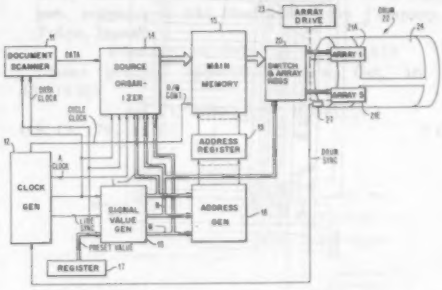
means actuated by the played back cue signals for recording video frames representative of still pictures for the audio program on said video storage medium in a sequence determined by the recording order of the plurality of audio programs on the video storage medium; and

means responsive to the played back cue signals from the audio recording for identifying the video frames recorded on the video storage medium and initiate recording of successive video frames thereon.

4,009,332
MEMORY MANAGEMENT SYSTEM FOR AN INK JET COPIER

Danny Allen Van Hook, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,631
Int. Cl.² H04N *1/40*
U.S. Cl. 358—280 **6 Claims**



1. A data handling and storage system for connecting the video data output of a document line scanner to a document printer which includes a plurality (N) of print elements arranged to traverse a media simultaneously in two substantially orthogonal directions and in which the video data derived from the scanner is used to selectively modulate the printing elements to reproduce the scanned document on the media comprising:

clock means responsive to positional information from said document printer for providing first control signals one of which is supplied to the document scanner for controlling the scannning rate thereof;

signal generator means responsive to the first control signals for providing second control signals (L), (W) and (N), each of which is a predetermined multiple of the first control signals;

a source organizer means responsive to said first and second control signals and including,

first means responsive to first control signals for storing alternate scan line data in first and second memory means each in a predetermined sequence,

second means responsive to first and second control signals for alternately reading stored signals from said first and second memories as a predetermined function of the values of the said first and second control signals, said first and second means controlling said memories at different times to provide insertion of signals in one memory

under control of said first means and reading of signals from the other memory under control of said second means on a concurrent basis and vice versa;

main random access memory means responsive to the first and second control signals for alternately reading data signals stored in addressable memory locations determined by the value of said first and second control signals and providing the said signals to the document printer for controlling selected print elements and for storing the data signals read by the said source organizer in addressable memory locations determined by the values of said first and second control signals; and

gating means responsive to said (N) control signal for selectively connecting the signals supplied by said main memory when read to selected printed elements.

4,009,333

CHARGE TRANSFER IMAGE DEVICE

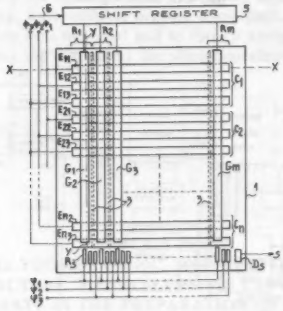
Jean-Luc Berger, and Daniel Woehrn, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1975, Ser. No. 621,749

Claims priority, application France, Oct. 18, 1974, 74.35146

Int. Cl.² H04N *3/02*

U.S. Cl. 358—213 **8 Claims**



1. An image device of charge transfer type comprising:

a matrix of *m* columns, each column constituting a linear transfer register of optical input type and including *n* charge coupled cells;

first means for controlling transfer along said registers, said means being common to said *m* registers;

second means for blocking said first means for controlling transfer, each of said *m* registers being provided with such a second means, and said second means being independently controlled for blocking transfer along *m* - 1 of said *m* registers and not blocking it along the m^{th} register;

and further means for sequentially extracting the *n* informations contained in the *n* cells of each of said *m* registers, in accordance with the *m* independent transfer operations realised by the *m* independent controls of said *m* second means.

4,009,334

VIDEO NOISE REDUCTION CIRCUIT

Richard Joseph Sypula, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 17, 1976, Ser. No. 667,739

Int. Cl.² H04N *5/21*

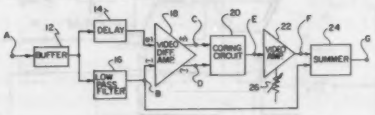
U.S. Cl. 358—167 **11 Claims**

5. Apparatus for reducing the noise in a video signal comprising:

a. means for extracting a relatively low-frequency component from the video signal;

b. means for subtracting said relatively low-frequency component from the video signal to yield a relatively high-frequency component;

c. means for removing relatively low-amplitude portions from said relatively high-frequency component to yield a cored high-frequency component; and



d. means for combining said relatively low-frequency component with said cored high-frequency component to produce a noise reduced video signal.

4,009,335

GRAY SCALE DISPLAY SYSTEM EMPLOYING DIGITAL ENCODING

Robert A. Payne, Des Plaines; Gregory E. Slobodzian, Chicago; Stanley A. Zielinski, and Ralph M. Ravanesi, both of Villa Park, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

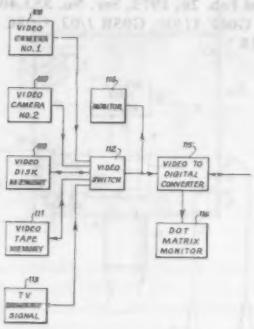
Filed Aug. 9, 1973, Ser. No. 387,006

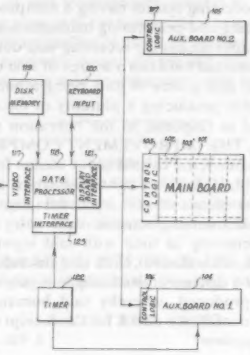
Int. Cl.² H04N *5/66;* **G09F** *9/32*

U.S. Cl. 358—240 **30 Claims**

1. A display system for displaying images comprising a matrix of display devices each capable of varying degrees of visual brightness, means for supplying a video signal for a complete video frame and representing an image, a converter receiving the video signal as its input and producing quantized signals representing more than two different amplitude levels in the video signal as its output, means for generating control synchronizing signals associated with the quantized signals to provide an indication with respect to each quantized signal as to what part of a video frame that quantized signal represents, means for encoding the quantized signals into digital signals having a fewer number of bits than the number of said amplitude levels, storage means capable of receiving and retaining encoded quantized signals for the entire matrix of display devices, means responsive to said control and synchronizing signals for storing the encoded quantized signals at specific locations in said storage means, means for extracting the encoded quantized signals from said storage means, means for directing the extractd encoded quantized signals to specific display devices corresponding to specific locations in said storage means, and means associated with each display device

and responsive to the extracted encoded quantized signal received by it to control the degree of visual brightness of that





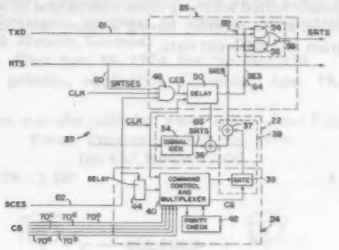
display device so that the matrix in its totality presents the image represented by the original video signal.

4,009,336
DIGITAL SIGNALING DEVICE

Thomas V. Saliga, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Apr. 7, 1975, Ser. No. 565,589
Int. Cl.² H04J 3/12
U.S. Cl. 179—15 BY **8 Claims**

1. A digital signaling device for use in combination with a digital transmission network having electronic data processing equipment interconnected therewith by analog transmission network, said digital signaling device comprising: signal generator means including a carrier signal generator means, said carrier signal generator means comprising means to generate a first digital output signal for transmission over the digital transmission network, command signal generator means having means to generate a second digital output signal, signal modulator means coupled to said carrier signal generator means and said command signal generator means, said signal modulator means having means to modulate said first and second digital output signals to generate a third digital output signal for transmission over the digital transmission network, signal control means coupled to said signal modulator means to selectively control the transmission of said first and third digital output signals; signal recovery means including a carrier signal recovery means having means to receive said first and third digital output signals and generate a fourth digital

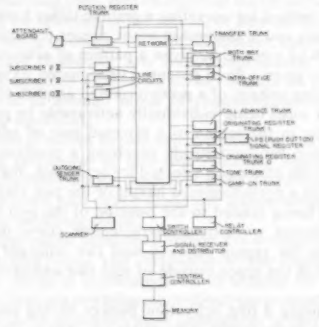


output signal in response thereto and command signal recovery means having circuitry to receive and detect said third digital output signal and generate said second digital output signal in response thereto.

4,009,337
STORED PROGRAM CONTROL TYPE ELECTRONIC EXCHANGE SYSTEM

Shigeo Sakai; Akira Ogishima; Akira Imada; Tetsuya Matsuno; Kazuo Suzuki, and Susumu Sugou, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,815
Claims priority, application Japan, Oct. 16, 1973, 48-115363
Int. Cl.² H04Q 3/54; H04M 3/42
U.S. Cl. 179—18 ES **5 Claims**



1. A stored program type electronic exchange system for use with equipment for generating dials signals, said system comprising a pluraltiy of trunks, including at least an originating register trunk and an outgoing sender trunk for converting the dial signals between serial pulse signals and parallel character signals and communicating with a programmed computer, character by character, the rest of said trunks fulfilling various compound functions including counting, storing, supervising the timing, and other associated logic operations; a speech-path network having terminals of said trunks and subscriber lines connected thereto, and adapted to selectively interconnect said terminals; a scanner means scanning the status of said subscriber line terminals and said trunks; a switch controller means for controlling said speech-path network; a relay controller means for controlling said trunks; a central controller operating on the basis of a stored program so as to alternately monitor the status of the subscriber line terminals and the status of the trunks by means of said scanner

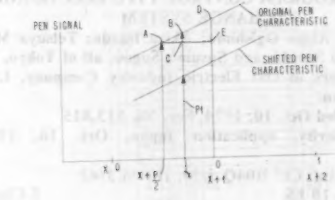
means, to temporarily halt the scanning, upon detection of any status change, for analyzing the status change thus detected, to successively execute a series of processes for realizing that stable status of the exchange system which is required by the analyzed status change, said series of processes being selected as a result of said analyzing the status change, and to resume the previously halted scanning upon completion of said series of processes; and a memory having memory area for storing the program and different data.

4,009,338

TABLET WITH IMPROVED PEN HEIGHT COMPENSATION

Herbert Dym; Paul Lowy, both of Poughkeepsie, and Greg Salyer, Wappingers Falls, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,470
Int. Cl.² G08C *21/00*
U.S. Cl. 178—18 **7 Claims**



1. A method for operating a graphic tablet having X dimension wires and Y dimension wires, means for selecting one of said sets of wires to be given a pattern of activation in which a wire is given a fixed potential (designated 0) or is given an alternating voltage of a predetermined amplitude (designated 1), said wires being individually activatable to produce a 0-1 transition in the region of a selected pair of adjacent wires, and a pen for capacitively receiving a position signal from wires of the dimension selected for activation, the pen position signal for a predetermined height of the pen above the tablet surface being related to the position of the pen between said two adjacent wires by a characteristic curve that is closely linear in the region between said two adjacent wires and a portion of the space outside of said two adjacent wires, comprising,

producing a first activation pattern having said 0-1 transition in the region of the wires adjacent to the pen position and sampling a first pen position signal, said first pen position signal representing a locus on the pen characteristic curve at said pen position,

producing a second activation pattern in which said 0-1 transition is shifted from the position of said first activation pattern by the pitch, P, between wires and sampling a second pen position signal, said second pen position signal representing a locus on said pen characteristic curve at a second position shifted from said pen position by the value of said pitch between wires,

producing a third activation pattern and sampling a third pen position signal, said third pen position signal representing a locus on said pen characteristic curve at a third position on said pen characteristic curve, and

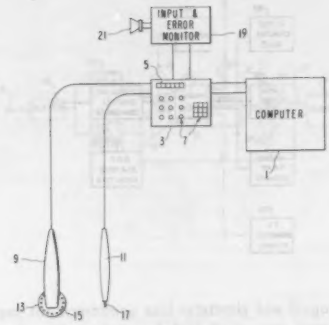
forming an address identifying the position of said pen with respect to one of said adjacent wires according to said value P and said first, second and third pen position signals.

4,009,339

DEVICE PROVIDING SENSIBLE OUTPUT INDICATING RECEIPT OF DATA BY COMPUTER

Richard C. Anderson, Los Altos, and Marc G. Mathers, Belmont, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Feb. 26, 1975, Ser. No. 553,405
Int. Cl.² G06F *11/00*; G05B *1/03*; G08C *21/00*
U.S. Cl. 178—18 **5 Claims**



1. In a data processing system having a computer means for receiving, recording and performing mathematical operations upon data, and input means for receiving said data, said input means being connected between a source of said data and said computer means, said source of data being a humanly operable data transducer producing a plurality of discrete units of input data signal in response to the operation thereof by a human operator, THE IMPROVEMENT COMPRISING input monitor means connected to said input means for generating a humanly sensible data entry signal indicative of the receipt by said computer means of said input data signal from said input means, said humanly sensible data entry signal being produced coextensively in time with said input data signal from said source, such that for each said discrete unit of said input data signal a discrete unit of said humanly sensible data entry signal is produced, whereby said human operator is provided with a confidence check for the receipt of data being inputted to the system.

4,009,340

LOADING COIL ASSEMBLIES FOR COMMUNICATIONS CABLES

George Debortoli, and Peter McGivery Chase, both of Ottawa, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 22, 1975, Ser. No. 615,549
Int. Cl.² H01F *17/08*
U.S. Cl. 178—46 **12 Claims**

1. A loading coil case assembly comprising:

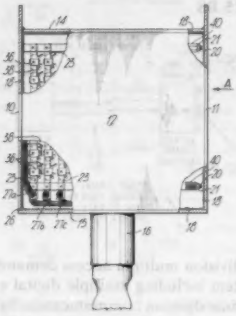
a case including base, front, back and side panels, the case of rectangular cross-section in a plane parallel to the base panel;

a cable end entry and a cable end exit in one of said panels, and a cable end in each of said entry and exit;

a support structure in said case for supporting a plurality of assembled loading coil magazines, conductors from said cable ends connected to loading coils in said magazines;

said support structure comprising a plurality of rods each attached at one end to the same one of said panels and extending normal thereto across said case, said rods arranged in a rectangular array, and spaced apart in one direction a distance substantially equal to the length of a magazine, a plurality of support members mounted sequentially on each rod, and a plurality of beams supported at each end on a support member and extending

across said case normal to the axis of said rods and normal to said one direction to provide two spaced parallel series of beams each series in a plane parallel to the plane of the two related rods carrying the support members supporting the related beams, the beams forming opposed pairs;



a plurality of elongated magazines supported at each end by one of said opposed pair of beams, each magazine having a plurality of loading coils positioned side by side therein, the axes of said loading coils parallel to each other and extending normal to the longitudinal axis of the magazine, to provide a plurality of layers of loading coil magazines; expanded synthetic resin electrically insulating material filling spaces in said case between said magazine.

4,009,341

DEVICE FOR REGENERATING TELEGRAPHIC SIGNALS

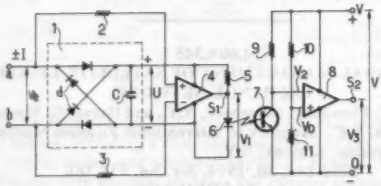
Michel Lemoussu, Palaiseau, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed May 9, 1975, Ser. No. 576,239

Claims priority, application France, May 27, 1974, 74.18283

Int. Cl.² H04L *25/02*

U.S. Cl. 178—69 A **5 Claims**



1. A device for regenerating telegraphic signals free of bias distortion, noise, and interference signals, said device comprising an input circuit receiving telegraphic signals to be regenerated, an output circuit comprising a decision circuit including an amplifier-comparator having a threshold decision level, said output circuit having an output with regenerated telegraphic signals produced thereat, means for coupling the input circuit and the output circuit, said input circuit including an amplifier-peak limiter receiving the telegraphic signals and effecting peak-limiting at a level close to zero, means for feeding said limiter with direct current voltage obtained from rectified incident telegraphic signals, said limiter having an output connected to the coupling means and at which a unipolar signal is produced which is a function of the amplitude of the telegraphic signals.

4,009,342

CIRCUIT ARRANGEMENT FOR COMMUNICATION FACILITIES WHEREIN TRANSMISSION PATHS CAN BE EMPLOYED FOR DIFFERENT TYPES OF MESSAGE SWITCHING

Franz Fahrenschon, Neuried; Horst Jäger, Munich; Hans Thinschmidt, Unterpfaffenhofen, and Alfred Meier, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

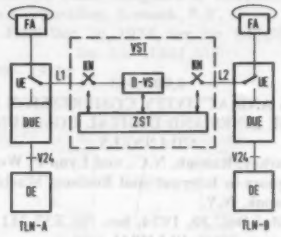
Filed Apr. 18, 1974, Ser. No. 462,030

Claims priority, application Germany, Apr. 19, 1973, 2320092

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 DP **4 Claims**



1. Apparatus for telecommunication systems having transmission paths capable of accommodating different types of message signals produced through using different modes of communication wherein connector sets for a plurality of modes of communication are connectable to a connecting path and having changeover means for switching from one mode of communication to another mode of communication in a given connecting path, said changeover means including a mode selector for selecting either manual or automatic switching from one mode of communication to another, comprising:

means in said connector sets for communicating a first switching signal to a called subscriber station for causing changeover to another mode of communication during automatic operation,

first changeover means in said called subscriber station for switching responsive to said first switching signal, said called subscriber station from one mode of communication to another, said called subscriber station being in an automatic switching mode,

means in said called subscriber station for evaluating said first switching signal and responsive to the changeover from one mode of communication to another for transmitting a first acknowledgement signal upon completion of said mode of communication changeover in said called subscriber station,

first means in said connector sets for monitoring said first acknowledgement signal and for communicating a second switching signal to the calling subscriber station for causing changeover from said one mode of communication to another,

second changeover means in said calling subscriber station for switching, responsive to said second switching signal, said calling subscriber station from said one mode of communication to another, said calling subscriber station being in an automatic switching mode,

means in said calling subscriber station for monitoring said second switching signal and for producing a second acknowledgement signal upon completion of a changeover from said one mode of communication to another,

second means in said connector sets for monitoring said second acknowledgement signal and producing an indication thereof and

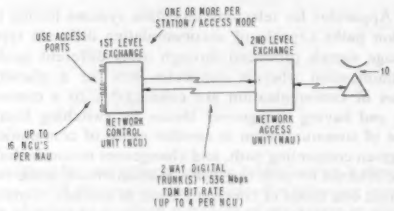
inquiry means in said connector sets for signalling, responsive to the monitored presence of said first and second acknowledgement signals, the occurrence of changeover from said one mode of communication to another at said calling and said called subscriber stations as an inquiry to said calling and called subscriber stations for the acceptance of the desired message signals and for monitoring the continuence of the readiness of data terminal equipment in said calling and called subscriber stations.

4,009,343

SWITCHING AND ACTIVITY COMPRESSION BETWEEN TELEPHONE LINES AND DIGITAL COMMUNICATION CHANNELS

Harold G. Markey, Raleigh, N.C., and Lynn P. West, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,211
Int. Cl.² H04J *3/06*
U.S. Cl. 179—15 BS **13 Claims**


ONE OR MORE PER STATION / ACCESS NODE
USE ACCESS PORTS
1ST LEVEL EXCHANGE
2ND LEVEL EXCHANGE
10
UP TO 16 NCU'S PER NAU
NETWORK CONTROL UNIT (NCU)
NETWORK ACCESS UNIT (NAU)
2 WAY DIGITAL TRUNK(S) 1.536 Mbps TDM BIT RATE (UP TO 4 PER NCU)

1. In a network of multiplex switching stations linked via cyclically recurrent channels of communication facilities, each said station having multiple ports attachable to separate telephone and data line circuits external to said network and providing varied time division connection links between said line circuits and said facilities, representing segments of virtual connections relative to ports of other stations, station apparatus comprising:

means for coupling communicatively with an ordered group of said recurrent channels;

random access storage means containing a group of storage locations accessible in ordered association with said group of channels;

means coupled to said storage means and channel coupling means for operating in each said recurrence cycle to assign selected said storage locations to successive said channels for ordered communicative coupling with said channels;

multiplex switch means operating cyclically in coordination with said recurrence cycles and in cooperation with apparatus at other said stations for providing variable call connection links between said ports and storage locations;

means for monitoring activity context of voice and data signals being handled between said line circuits and said switch means; and

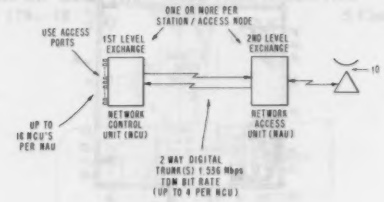
means supplying indications of said monitored activity to said channel assignment means in ordered association with locations receiving respective traffic for controlling selection of said locations by said channel assignment means.

4,009,344

INTER-RELATED SWITCHING, ACTIVITY COMPRESSION AND DEMAND ASSIGNMENT

Donald C. Flemming, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,212
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 BS **18 Claims**


ONE OR MORE PER STATION / ACCESS NODE
USE ACCESS PORTS
1ST LEVEL EXCHANGE
2ND LEVEL EXCHANGE
10
UP TO 16 NCU'S PER NAU
NETWORK CONTROL UNIT (NCU)
NETWORK ACCESS UNIT (NAU)
2 WAY DIGITAL TRUNK(S) 1.536 Mbps TDM BIT RATE (UP TO 4 PER NCU)

1. In a time division multiple access demand assigned communication system including multiple digital exchange terminals linked for time division communication by a multiaccessible communication transmission facility, said exchange terminals serving to switchably link multiple space separated lines carrying digital data and digitalized voice telephone information traffic to time channels of said facility, said facility having fixed assigned order channels and demand assignable traffic channels in recurrent time division frames for respectively carrying supervisory information and line traffic information between said terminals, terminal apparatus comprising:

means for utilizing information exchanged with other terminals through said order channels for demand assigning a variable number of said traffic channels to the respective terminal;

means containing multiple buffer storage locations for temporary storage of traffic information in transit between multiple lines of the respective terminal and traffic channels demand assigned to the respective terminal;

first selective switching mean operating in time coordination with said time division frames for passing traffic information between selected said storage locations and successive said assigned traffic channels in each frame; and

second selective switching means operating in time coordination with said first switching means for passing traffic information between said storage locations and lines variously paired with said locations.

4,009,345

EXTERNAL MANAGEMENT OF SATELLITE LINKED EXCHANGE NETWORK

Donald C. Flemming, Rhinebeck, N.Y., and Harold G. Markey, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,281
Int. Cl.² H04J *5/00*
U.S. Cl. 179—15 BA **7 Claims**

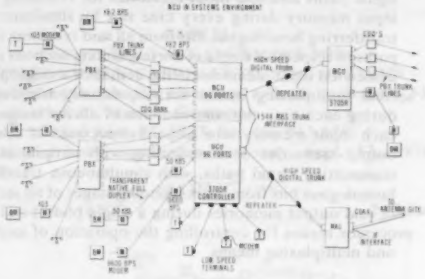
1. In a communication system of multiple interactive multiplex switching stations inter-communicating in multiplex via a shared medium of communication to variably establish, administer and release call connection paths between subscriber ports linked to external user equipment, the management method comprising:

providing for certain said ports to be accessible for conducting external management data communications between said stations and external data processing equipment;

establishing said variable connection paths between ports of said stations including said certain ports without external assistance;

restricting the selection of said connections in accordance with path specifying information erasably stored at said stations;

utilizing communications conducted between said certain ports through said variable connection paths established, administered and released by said stations to inform said external data processing equipment of the operations of said system and to enable said external equipment to



process said information and supply related communications to said stations; and

utilizing said related communications to vary said stored path specifying information and thereby to adapt the connection configuring restrictions at said stations to changes in system operating conditions.

4,009,346

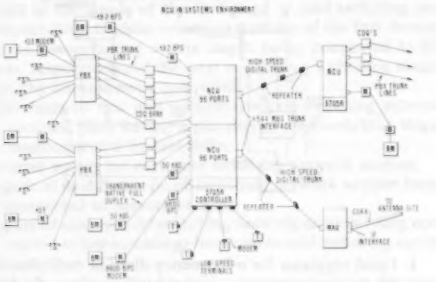
DISTRIBUTIONAL ACTIVITY COMPRESSION

Brian E. Parker, Poughkeepsie, N.Y., and Lynn P. West, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,501

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AQ **14 Claims**



1. In a time division multiplex multiple access communication system, including a communication facility having multiple access nodes and terminal apparatus linking individual said nodes with multiple separate line circuits associated with individual voice telephone and data communication trunks representing origin (input) and destination (output) attachments to individual users of the system, terminal apparatus comprising:

means linked to one said node for receiving a composite of time division signals representing activity compressed channels of information supplied, through other said nodes and said facility, from multiple said line circuits linked as input sources to said other nodes;

means linked to said receiving means for storing selected said channels of received information associated with output line circuits served by said system through said one node;

means coupled to said storing means for ordering said stored channels in time and space ordered associations with respective virtual channels and thereby with respective output line circuits served through said one node;

means for mapping said ordered channels into actual time division channels by activity compression; and

means coupled to said last-mentioned means for distributing representations of said ordered and activity compressed channels through said actual time division channels to respective said output line circuits thereby completing switched virtual connections through said system with respective said input line circuits linked as sources to said other nodes.

4,009,347

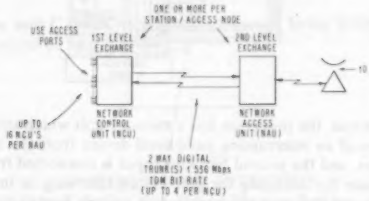
MODULAR BRANCH EXCHANGE AND NODAL ACCESS UNITS FOR MULTIPLE ACCESS SYSTEMS

Donald C. Flemming, Rhinebeck, N.Y.; Harold G. Markey, Raleigh; Ralph J. Metz, Cary, both of N.C., and Lynn P. West, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,502

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 BS **11 Claims**


ONE OR MORE PER STATION / ACCESS NODE
USE ACCESS PORTS
1ST LEVEL EXCHANGE
2ND LEVEL EXCHANGE
NETWORK CONTROL UNIT (NCU)
NETWORK ACCESS UNIT (NAU)
UP TO 16 NCU'S PER NAU
2 WAY DIGITAL TRUNK(S) 1.536 Mbps TDM BIT RATE (UP TO 4 PER NCU)

1. Modular data communication exchange terminal apparatus for communicatively linking space separated lines, carrying digital data and digitalized voice telephone information traffic, with associated remote lines through an access node of a time division multiple access communication facility comprising:

a first module serving multiple said lines and a second module providing time division links between said first module and said access node of said facility; said first module autonomously administering buffered time division connections, between time-ordered groups of *n* internal channels and various said lines, and selectively assigning up to *m* (less than *n*) of said internal channels of each internal group, in recurrent time frames, to be communicatively linked to respective channels in time-ordered groups of up to *m* external (intra-nodal) channels extending to said second module; said second module autonomously administering buffered time division connections between said external (intra-nodal) channels and respective groups of up to *m* variably available external (internodal) channels of said facility.

4,009,348

FAULT BYPASS FOR A PROCESSOR ASSOCIATED SCANNER

Michael Bernard Tate, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed June 2, 1975, Ser. No. 582,976

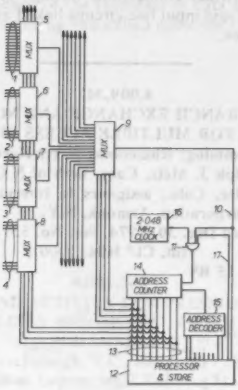
Claims priority, application United Kingdom, June 21, 1974, 27532/74

Int. Cl.² H04M *3/12*

U.S. Cl. 179—15 BF **5 Claims**

1. A processor equipment comprising a processor for receiving information from multiplexing means connected to a plurality of peripheral devices, an address counter for controlling said multiplexer means to scan the peripheral devices for processor interrupt signals, a clock generator controlling said address counter, and address lines connecting said address counter to said multiplexing means and said processor enabling the processor to receive the count contained in said

counter and to modify said count, the improvement wherein a gate circuit is provided with one clock and two blocking inputs and the clock input of the gate circuit is connected to the clock generator and its output is connected to the address counter, the output of said multiplexing means is connected both with the processor and with the first blocking input of the



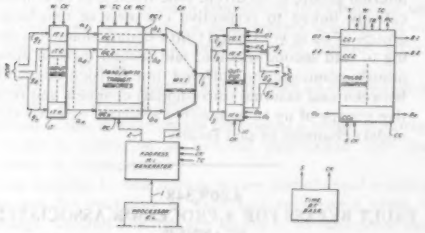
gate circuit, the processor has a memory unit which stores the address of an interrupting peripheral device from the address counter, and the second blocking input is connected from the processor for inhibiting the gate circuit following an interrupt signal until the next valid address is written into the address counter by the processor.

4,009,349

SWITCHING STATION FOR PCM TELECOMMUNICATION SYSTEM

Piero Belforte, and Giovanni Perucca, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed Sept. 4, 1975, Ser. No. 610,377
Claims priority, application Italy, Sept. 4, 1974, 69678/74
Int. Cl.² H04Q *11/04*
U.S. Cl. 179—15 AT **6 Claims**



1. A switching station for a pulse-code-modulation telecommunication system wherein information is exchanged between a multiplicity of incoming channels and a multiplicity of outgoing channels, each of said channels consisting of a sequence of h-bit words, the words of a predetermined number *p* of channels being interleaved in respective time slots of *h* phases each forming part of a recurrent frame period, comprising:

a set of receiving signal paths divided into n groups of *m* paths, each of said paths carrying a respective incoming frame;

a set of transmitting signal paths divided into n groups of *m* paths, each of the latter paths carrying a respective outgoing frame;

a set of *n* input memories respectively associated with said groups of receiving signal paths, each of said input memories including *m* sections of *h* stages each;

a set of *n* output memories respectively associated with said groups of transmitting signal paths, each of said output memories including *m* sections of *h* stages each;

first multiplexing means between said groups of receiving signal paths and said input memories for reloading each input memory during every time slot by simultaneously transferring homologous bits from all said receiving signal paths to respective stages of corresponding sections of the associated input memories in the course of a single phase;

second multiplexing means for sequentially transferring, during each time slot, the contents of all the sections of each input memory into respective sections of selected output memories communicating with certain of said transmitting signal paths, with simultaneous transfer of homologous bits from corresponding stages of all sections of said output memories during a single phase; and

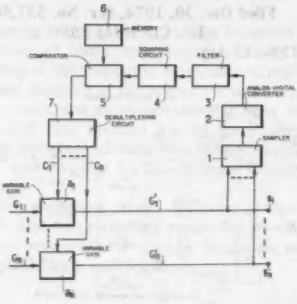
processor means for controlling the operation of said second multiplexing means.

4,009,350

LEVEL REGULATOR OF THE DIGITAL TYPE

Alain Cabet, Paris; Gaston Pinier, Longjumeau; Pierre Semur, Garches, and Marie-Annick Roy, Antony, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 6, 1975, Ser. No. 620,134
Claims priority, application France, Oct. 8, 1974, 74.33786
Int. Cl.² H04J *1/16*
U.S. Cl. 179—15 BP **5 Claims**



1. Level regulator for *n* frequency division multiplex transmission systems comprising *n* variable gain networks for adjusting the transmission level of said multiplex systems respectively, from the amplitudes of *n* pilot waves contained in said systems, a sampling device connected to said variable gain networks and rhythmed by a clock for sequentially sampling the multiplex systems downstream from said networks and delivering the samples concerning said *n* systems, in a time division multiplex form, an analog-digital converter for sending out digital values of the samples coming from the sampling device, digital filtering means having a narrow band and operating on a time sharing basis for said *n* systems for sending out, successively, at each sampling period in response to the *n* digital values of the samples of said *n* systems respectively, *n* digital values *y*1 to *yn* representing respectively the sampled amplitudes of the pilot waves extracted from the multiplex systems downstream from the networks, a calculation circuit receiving at each sampling period the values *y*1 to *yn* and operating on a time sharing basis for elaborating new values *z*1 to *zn* which are, respectively, function of the levels of the pilot waves downstream from the variable gain networks over a time interval of several sampling periods, a comparison element for comparing at each sampling period each of said

values z1 to zn with a reference value and delivering as the results of these comparisons *n* values for the control of said *n* variable gain networks respectively, and a demultiplexing circuit connected to the output of said comparison element for applying said *n* values for the control to said *n* variable gain networks respectively.

4,009,351
SWITCHING ARRANGEMENT FOR TELECOMMUNICATION SWITCHING SYSTEMS

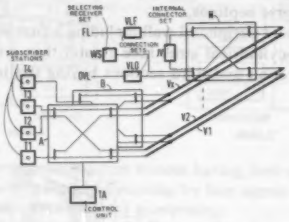
Helga Hofstetter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 15, 1975, Ser. No. 613,639

Claims priority, application Germany, Sept. 13, 1974, 2443941

Int. Cl.² H04Q *3/68*

U.S. Cl. 179—18 GE **2 Claims**



1. In a telecommunication switching system having a switching arrangement wherein there is a switching network comprising a plurality of switching matrices forming a plurality of switching stages, said stages being interconnected in sequence by links, the trunks and all switching equipment necessary for the completion and monitoring of a connection being connected to the inputs of the first stage of said switching network, the outputs of the switching matrices of the first through next to last switching matrix stages being connected to the inputs, respectively, of the next succeeding switching matrix stage, the improvement comprising:

pluralities of first and second types of switching network sections, each having a plurality of said switching stages interconnected by said links,

control means for each said switching network section,

inputs of said first type of switching network section being connected to subscriber lines,

inputs of said type of switching network section being connected to interexchange lines and to said switching equipment and

a number of coupling multiples corresponding to the number of different outputs per switching network section, corresponding outputs of each said switching network section being connected in parallel to an individual coupling multiple.

4,009,352
MULTIPLE LINK CIRCUIT FOR A PORT MULTIPLEXER

Barry C. Breen, Woodinville, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.

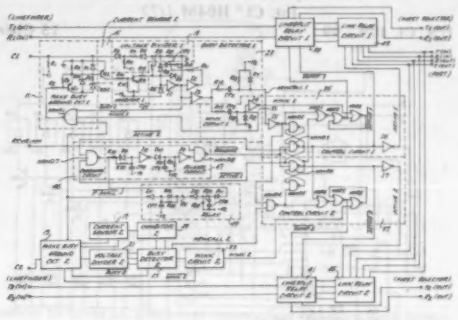
Filed Jan. 19, 1976, Ser. No. 650,303

Int. Cl.² H04M *3/22*

U.S. Cl. 179—18 FF **17 Claims**

1. In a multiple link circuit for a port multiplexer including a plurality of links for: detecting the placing of busy status information on the C-leads of a telephone system extending between linefinder/first selector combinations; splitting related linefinder/first selector tip and ring leads; and, connecting the related linefinder/first selector tip and ring leads to a port, the improvement comprising:

detecting means, forming a portion of each of said plurality of links, for detecting said busy status information carried



by said C-leads, said detecting means being bridge connected to said C-leads.

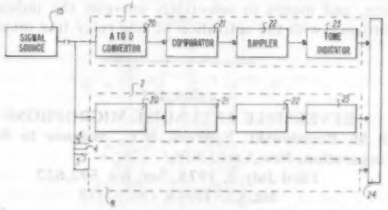
4,009,353
ANALOG SIGNAL DETECTION

Randell Leland James, and James Thomas Padden, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,320

Int. Cl.² H04M *1/50*

U.S. Cl. 179—84 VF **8 Claims**



1. Electronic signal detection apparatus for detecting the presence of a complex waveform analog signal of known waveform characteristics from a source of signals of unknown waveform characteristics, said apparatus comprising:

a. converter means coupled to said source for generating digital signals having digital formats respectively representative of the waveform characteristics of each of said signals of unknown waveform characteristics;

b. comparator means coupled with said converter means and comprising first means defining a prespecified digital format representative of said known waveform characteristics, and second means generating a detect signal when the digital format of one of said digital signals matches said prespecified digital format;

c. indicator means generating a signal at its output in response to said generated detect signal, and

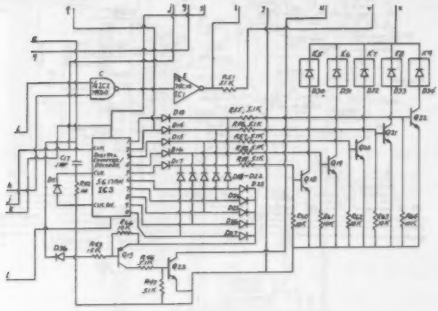
d. sampler means coupled between said comparator means and said indicator means for preventing the generation of a signal from said indicator means except upon the occurrence of a minimum number of detect signals from said second means during a prescribed time period.

4,009,354

SIGNALLING DEVICE FOR KEY TELEPHONE SYSTEMS

Louis W. Champan, Kent, Wash., assignor to Melco, Bellevue, Wash.

Filed Sept. 5, 1975, Ser. No. 610,853
Int. Cl.² H04M 1/72
U.S. Cl. 179—99 **15 Claims**



1. In a key telephone intercom circuit for operating with up to 19 stations, a calling system having a hook switch-controlled loop with keying means at a calling station to open and close the loop to generate a sequence of pulses, means to sense the closing of the loop when a calling telephone is placed off hook, pulse conditioning circuit means, means to pass the sequence of pulses to said pulse conditioning means, digital counter and decoding means connected to the output of said pulse conditioning circuit means and generating decoded decimal outputs in accordance with the numbers of sequential pulses, diode matrix means connected to the outputs of said counter and decoding means, means connected to said diode matrix means to sense said decoded decimal outputs, relay tree means connected to said diode matrix means through said last-named sensing means and having respective branches connected to indicators at the telephones of the system, and means to selectively energize the indicators in accordance with the activation of said relay tree means.

4,009,355

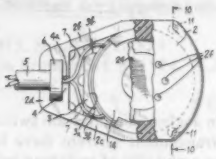
REVERSIBLE ANTI-NOISE MICROPHONE

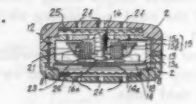
Lech M. Poradowski, Yonkers, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed July 2, 1975, Ser. No. 592,632
Int. Cl.² H04R 1/02, 1/38
U.S. Cl. 179—121 D **4 Claims**

1. A reversible anti-noise microphone, including:
a. a housing comprising two identical parts, each part including:
1. a peripheral wall; and
2. a transverse wall, each said transverse wall defining a face of the housing;
b. means fastening the housing parts together with said peripheral walls abutting and said transverse walls spaced apart and forming first and second opposite faces with at least one sound transmitting opening in each face;
c. a transducer enclosed in the housing including a diaphragm having opposite surfaces;
d. means defining a first acoustical path providing communication between the opening in the first face of the housing and a first surface of said diaphragm;
e. means defining a second acoustical path providing communication between the opening in the second face of the housing and a second surface of the diaphragm, said first path being acoustically longer than the second path;
f. first acoustical resistance means in the first path; and
g. second acoustical resistance means in the second path, said second acoustical resistance means having a greater acoustical loss than the first acoustical resistance means, the losses being inversely related to the lengths of said paths so that the frequency response curves of the two paths are substantially the same.

3. A microphone including:
a. a housing comprising:
1. two abutting parts of similar form, said housing having two opposed faces, at least one face having a sound transmitting opening therein, each said housing part including:
i. a peripheral wall, and a transverse wall, each transverse wall defining a face of the housing; and
ii. means fastening the housing parts together with the peripheral walls abutting;
b. a transducer in the housing including two electrical terminals, and a diaphragm upon which sound passing through the opening impinges;
c. each of the two housing parts including first and second transverse septums;
d. each said peripheral wall including a first section having a part-cylindrical inner face greater than a semi-cylinder and second and third sections having flat inner surfaces





extending tangentially from the first section and converging to an end section;
e. said first transverse septums having part-cylindrical surfaces cooperating with the inner faces of said first wall sections to define a cylindrical recess receiving the transducer;
f. said second transverse septums extending between said second and third wall sections and cooperating therewith and with said first transverse septums to define a second recess;
g. said second transverse septums cooperating with said end sections and said second and third wall sections to define a third recess receiving a conduit anchor, said end sections having cooperating notches defining a passage therein receiving a conduit;
h. said second transverse septums having opposed notches receiving wires extending from said conduit;
i. said first transverse septums having opposed notches at each end, each pair of opposed notches receiving a wire from said conduit; and
j. said first and second transverse septums cooperating with said notches to define tortuous strain relieving passages for said wires.

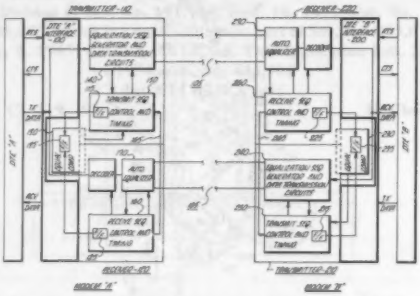
4,009,356
DATA MODEMS HAVING DATA DROP-OUT AND DATA ECHO PROTECTION

Richard Borysiewicz, Miami, and Charles W. Roedel, Miami Shores, both of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Division of Ser. No. 438,387, Jan. 31, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 600,958

Int. Cl.² H04L *25/08*

U.S. Cl. 179—170.2 **7 Claims**



3. In a data communication system having first and second modems capable of communicating by line signals over telephone lines, the improvement comprising:

means at the transmitter of a first modem for transmitting line signals comprising data message signals preceded by a tone signal;

means at the receiver of the second modem for receiving said line signals;

means at said receiver responsive to the absence and reappearance of said line signals for sampling the reappeared line signal for the presence of said tone signal; and

means at said receiver responsive to said sampling means for emitting a line drop out indicating signal.

7. In a communication system having first and second modems capable of communicating by line signals over telephone lines, said modems operating over said telephone lines in a two wire half duplex mode, the improvement comprising:

means at the transmitter of a first modem for transmitting line signals comprising data message signals preceded by a tone signal;

means at the receiver of the second modem for receiving said line signals;

means at said receiver responsive to the absence and reappearance of said line signals for sampling the reappeared line signal for the presence of said tone signal; and

means at said receiver responsive to said sampling means for emitting a reflected data-indicating signal.

4,009,357
ANTI-STATIC KEYLOCK SWITCH

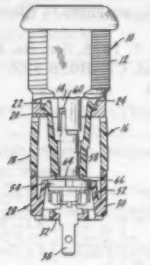
Herbert C. Naylor, Carpentersville, Ill., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Oct. 1, 1975, Ser. No. 618,407

Int. Cl.² H01H *27/00*

U.S. Cl. 200—42 R **13 Claims**

1. An anti-static keylock assembly including a keylock device having a rotatable locking element, an adapter formed of an electrically non-conductive material, cooperating means on said adapter and keylock device forming an interlock therebetween, a terminal assembly formed of an electrically non-conductive material and cooperating means on said adapter and terminal assembly forming an interlock therebetween, a rotor assembly formed of an electrically non-conductive material positioned within said terminal assembly and having a shaft extending toward and interlocked with said rotatable locking element, a pair of electrical terminals extending outwardly from said terminal assembly, a rotor contact carried by said rotor assembly and rotatable to a



position to form an electrical connection between said terminals.

4,009,358
ELECTRIC CIRCUIT-BREAKER FOR ALTERNATING CURRENTS

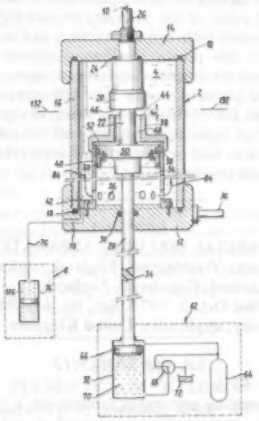
Jean Louis Gratzmuller, 66 Boulevard Maurice Barres, Neuilly sur Seine, France (92200)

Filed May 21, 1975, Ser. No. 579,593

Claims priority, application France, May 22, 1974, 74.17800

Int. Cl.² H01H *33/68*

U.S. Cl. 200—150 B **15 Claims**

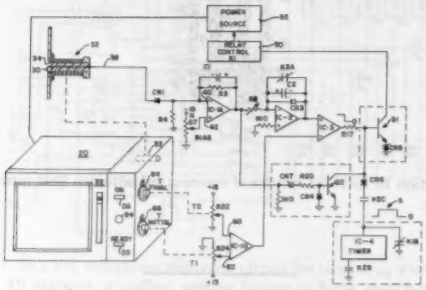


1. An electric circuit-breaker for alternating current and containing a liquid dielectric consisting of SF_6 gas liquefied under a pressure which is always higher than the critical pressure, wherein said circuit-breaker comprises a main chamber or interrupting chamber which contains the stationary and moving contacts as well as an auxiliary or arc-quenching cylinder divided into two compartments having volumes which are inversely variable by means of a piston actuated conjointly with the moving contact, the first compartment being adapted to communicate with the interrupting chamber through a duct in the form of a nozzle for centripetal radial quenching which has its opening in the vicinity of and between said contacts whilst the second compartment is in direct communication with the interrupting chamber.

4,009,359
METHOD AND APPARATUS FOR CONTROLLING MICROWAVE OVENS

Gene E. Tallmadge, Palo Alto, and John E. Gerling, San Mateo, both of Calif., assignors to Chemetron Corporation, Chicago, Ill.

Filed Nov. 7, 1975, Ser. No. 629,915
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 B **5 Claims**



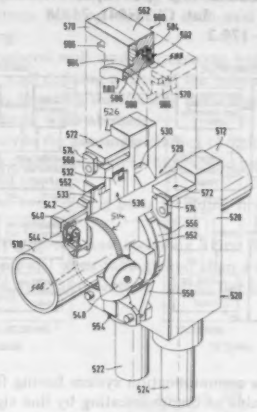
3. Apparatus for controlling the temperature rise of material being heated in a microwave oven to which electromagnetic energy is applied comprising means for sensing the residual field strength of the electromagnetic field within the oven at a position outside of or remote from the material being heated, means for reducing the measured field strength by an amount sufficient to provide a reference value approaching zero reference level when said oven is maximumly loaded, means for establishing an initial temperature T_1 of the material placed in said oven, means for selecting a final desired temperature T_2 of said material, means for comparing said temperatures T_1 and T_2 to develop a demand signal therefrom corresponding to the difference in temperature, means for integrating the sensed value of the intensity of said electromagnetic field as so reduced with respect to time and at a rate which corresponds to the power dissipation within the material within said oven to develop an integral signal increasing in time and correspondence with the temperature rise in said material, means for comparing the integral signal so derived with said demand signal and switching off the electromagnetic energy supplied to said oven when said integral signal reaches the value of said demand signal.

4,009,360
ORBITAL WELDING APPARATUS

Stanley Beetham, Washington, England, assignor to Clarke Chapman Limited, Gateshead, England

Filed Oct. 2, 1975, Ser. No. 618,983
Claims priority, application United Kingdom, Sept. 9, 1975, 36947/75
Int. Cl.² B23K 9/12
U.S. Cl. 219—60 A **5 Claims**

1. Orbital welding apparatus comprising a main assembly including a support structure carrying first and second rotary drive means and being of generally U shape and having two opposed relatively fixed structure limbs to receive therebetween a tube to be welded; clamp jaws movable relative to said structure to release or grip a tube received between said structure limbs; a rotatable assembly carried by said support structure and comprising first and second relatively rotatable gear members rotatable about a common axis, said gear members each being of generally U shape and having two opposed relatively fixed limbs, said gear members being rotatable into like positions in which said gear limbs are positioned to receive said tube as it is received between said structure limbs, said first and second gear members being rotationally coupled to said first and second drive means, respectively, said rotatable assembly also comprising arc welding means including wire feed roller mechanism mounted on and for rotation as a unit with said first gear member and a wire feed gear wheel meshing with said second gear member, said feed roller mechanism being in driving connection with said wire feed gear wheel and thus being operable by relative rotation of said first and second gear members; conductive means for supplying welding current to said arc welding means; and gas duct means

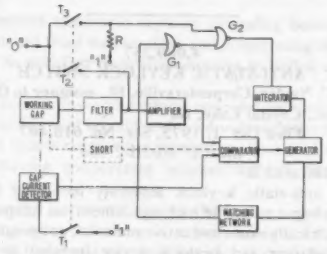


for supplying gas to said arc welding means; said rotatable assembly further comprising first and second auxiliary gear members removably locatable in bridging relationship to the respective gear limbs of said first and second gear members, said first and second rotary drive menas each comprising but a single driven gear wheel in driving relationship with the respective gear member and respective auxiliary gear member.

4,009,361
ELECTRICAL DISCHARGE MACHINING APPARATUS WITH MONITORING CIRCUIT AND MEANS TO CHECK THE OPERABILITY OF THE MONITORING CIRCUIT

Anthony Howard Stanton, and Peter Laurence Taylor, both of Wetherby, England, assignors to Sparcatron Limited, England

Filed Dec. 4, 1974, Ser. No. 529,508
Claims priority, application United Kingdom, Dec. 12, 1973, 56184/73; May 23, 1974, 23145/74
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 C **9 Claims**



1. A circuit for controlling an EDM process in EDM machines having a logical monitoring circuit for detecting a wrong discharge pulse out of the simultaneous occurrence and absence of certain electrical characteristics in the electrical discharge at a discharge gap, said circuit including means for effecting a short interruption of the EDM process, when such

wrong discharge pulses occur, the improvement comprising an input-device connected with the circuit for supplying to the monitoring circuit an arbitrary input of test signals which simulate a wrong discharge pulse, to thereby enable checking of the monitoring circuit.

4,009,362

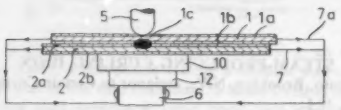
PROCESS AND APPARATUS FOR WELDING SHEET METAL COATED WITH LAYERS

Otto Alfred Becker, Robert-Koch-Strasse 59, 66 Saarbruecken 6, Germany

Division of Ser. No. 181,149, Sept. 16, 1971, Pat. No. 3,798,407, which is a continuation-in-part of Ser. No. 823,077, May 8, 1969, Pat. No. 3,614,375. This application Feb. 25, 1974, Ser. No. 445,109

Int. Cl.² B23K *11/10*

U.S. Cl. 219—92 **18 Claims**



1. An apparatus for the connection by electrical fusion of sheet metal panels at least one of which is coated on its lower, outer surface with an insulating layer, and at least one of said sheet metal panels being provided with a coated insulating layer which is disposed between said sheet metal panels when said sheet metal panels are superimposed, wherein the improvement comprises:

a. first electrode means contacting the top of the upper sheet metal panel;

b. a first cable connecting the sheet metal of said upper panel to a counterelectrode means for supplying a prewarming current only to said upper panel for melting said insulating layer disposed between said sheet metal panels; and

c. a second cable connecting said counterelectrode means to said lower sheet metal panel, said second cable carrying current from said first electrode means through said upper sheet metal panel to said lower sheet metal panel for fusion of metal at the welding zone, whereby said outer insulating layer of said lower sheet metal panel remains undamaged.

4,009,363

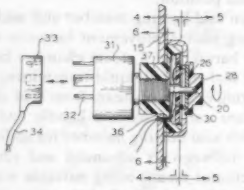
VEHICLE SWITCH ATTACHMENT

Ernest W. Binegar, 37 Indian Creek Road, New Smyrna Beach, Fla. 32069

Filed Jan. 19, 1976, Ser. No. 650,505

Int. Cl.² H01H *3/08*

U.S. Cl. 200—336 **9 Claims**



1. A vehicle switch attachment comprising in combination:

a decorative cover to fit over the protruding portion of a switch mounted to a vehicle dashboard, said protective cover having electrical contacts mounted therein;

electrical conductors connected to said electrical contacts in said decorative cover and extending therefrom; and

a knob adapted to fit onto a switch shaft adjacent said decorative cover having electrical contacts therein, said knob electrical contacts being positioned to open and close a circuit between said decorative cover electrical contacts as said knob is moved between positions, whereby actuation of a vehicle switch will simultaneously actuate an accessory switch.

4,009,364

CURING OF PROTECTIVE COATINGS WITH IRASER BEAMS

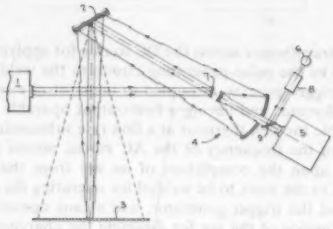
Elmar Ladstädter, Graz, Austria, assignor to Vianova-Kunstharz, A.G., Vienna, Austria

Filed Mar. 21, 1974, Ser. No. 453,561

Claims priority, application Austria, Mar. 28, 1973, 2700/73

Int. Cl.² B23K *27/00*

U.S. Cl. 219—121 L **10 Claims**



1. System for curing protective coating compositions over a large area with infrared radiation emitted by IRASERS comprising

—a composition to be cured;

—an IRASER source;

—fixed mirror means for receiving IRASER beams from said IRASER source;

—movable mirror means movable around two axes so constructed, arranged, and positioned with respect to said fixed mirror means and said composition so as to simultaneously receive IRASER beams reflected from said fixed mirror means; direct received IRASER beams to said composition to be cured in a scanning pattern; simultaneously receive heat rays from said composition and direct said received heat rays to temperature-responsive means, and

—temperature-responsive means for receiving and measuring the temperature of heat rays so constructed, arranged, and positioned with respect to said movable mirror means to receive said heat rays from said movable mirror means, said system providing uniform curing of said protective coating over a large area.

4,009,365

PULSED-DC ARC WELDING

Lyubomir Tzonev Kalev; Kostadin Zikov Zikov, and Ivan Kirilov Marvakov, all of Sofia, Bulgaria, assignors to Institut po Metaloznanie i Technologia na Metalite, Sofia, Bulgaria

Division of Ser. No. 533,713, Dec. 17, 1974. This application June 2, 1975, Ser. No. 592,364

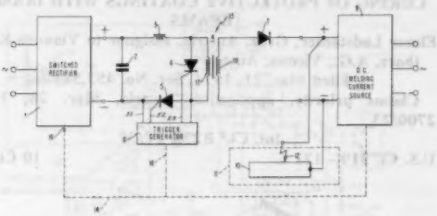
Claims priority, application Bulgaria, Dec. 17, 1973, 27445

Int. Cl.² B23K *9/10*

U.S. Cl. 219—135 **6 Claims**

1. In a welding apparatus powered from conventional AC mains for supplying a welding current to a consumable welding electrode that contacts the work to be welded in a protective atmosphere, the welding current having a steady DC component generated by a DC source whose output is coupled to the welding electrode, and a superimposed cyclic pulse component developed by a pulse-generating circuit, the im-

provement wherein the pulse-generating circuit comprises, in combination, a capacitor, a pulse transformer, a charging circuit coupled across the capacitor and operable to charge the capacitor, a discharge circuit including a choke, a primary winding of the pulse transformer and a normally disabled first thyristor coupled across the capacitor, the inductance of the discharge circuit cooperating with the capacitance of the capacitor to establish an oscillatory current flow through the first thyristor, means for coupling the secondary winding of



the pulse transformer across the DC source for applying pulses produced by the pulse-generating circuit to the welding electrode, a trigger generator coupled to the control electrode of the first thyristor and having a first output operable to cyclically enable the first thyristor at a first rate substantially independent of the frequency of the AC mains, means rendered effective upon the completion of an arc from the welding electrode to the work to be welded for operating the charging circuit and the trigger generator, and means operative upon the interruption of the arc for disabling the charging circuit.

4,009,366

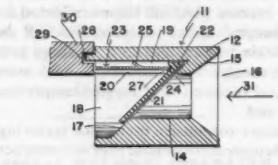
THERMAL PULSE TYPE HEATER AND VALVE THEREFORE

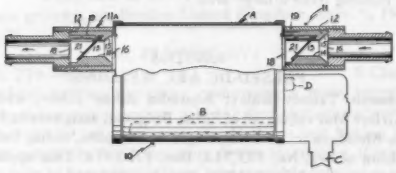
Russell D. Danell, Winnipeg, Canada, assignor to James B. Carter Limited, Winnipeg, Canada

Continuation-in-part of Ser. No. 608,876, Aug. 29, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,376

Int. Cl.² F02N *17/04*; **F16K** *15/14*

U.S. Cl. 219—208 **12 Claims**





1. A thermal type pulse heater comprising in combination a body portion, an electric heater element therein, an inlet fluid passageway and an outlet fluid passageway situated adjacent either end of said body portion and adjacent the upper side thereof respectively, a flexible flap valve in at least one of said passageways, a valve seat in the wall defining said one passageway, said flap valve extending across said one passageway occluding same when engaged with said valve seating and means detachably mounting said flap valve by one side thereof in said wall defining said one passageway, said last mentioned means including a retainer slot formed in the wall of said one passageway, a locking strip slidably engageable within said slot and engaging said flap valve by said one side thereof, overhanging means on said one side of said flap valve engaged by said locking strip and means to detachably retain said locking strip within said slot.

4,009,367

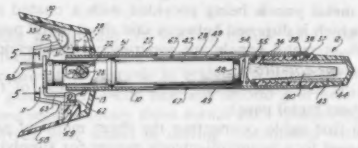
STEAM-PRODUCING CURLING IRON

L. P. Rizzuto, Brooklyn, N.Y., assignor to Conair Corporation, Edison, N.J.

Filed Jan. 29, 1975, Ser. No. 545,053

Int. Cl.² H05B *1/00*; **A45D** *1/04*, *2/36*, *7/02*

U.S. Cl. 219—222 **17 Claims**



1. A steam-producing curling iron comprising:

a. a tubular barrel of appropriate size and shape for having hair wound around it, said barrel having holes along at least a portion of its length, said holes extending through the wall of said barrel,

b. an elongated heating member axially slidable within said barrel between an advanced position and a retracted position, said barrel having a plurality of elongated depressions for guiding the movement of said heating member,

c. a handle at one end of said barrel,

d. a liquid-containing means at the other end of said barrel, said liquid-containing means including a reservoir and a liquid-transmitting means communicating with said reservoir and exposed within said barrel in a region which communicates with said holes, said liquid-transmitting means being in the path of movement of said heating member and arranged to be contacted by said heating member, to produce steam, when said heating member is in its advanced position,

e. a seal between said heating member and said barrel, said seal permitting sliding movement between said heating member and barrel, and a steam chamber being defined between said seal and said liquid-transmitting means, said holes permitting escape of steam from said chamber, and

f. actuator means carried by said handle and operatively associated with said heating member for sliding said heating member between its advanced and retracted positions, said actuator means being movable with respect to said handle and being located so that it may be operated by the same hand of the user which grasps said handle,

whereby when hair is wound around said barrel and said actuator means is manipulated to slide said heating member to its advanced position, steam produced within said barrel flows out of said barrel through said holes and is applied to the wound hair.

4,009,368

YOGHURT-MAKING MACHINE

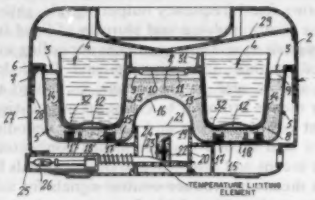
Andre Faivre, Dijon, and Pierre Tanguy, Daix, both of France, assignors to Etud S.A., Dijon, France

Filed Sept. 6, 1974, Ser. No. 503,919

Claims priority, application France, Sept. 25, 1973, 73.34316

Int. Cl.[2] H05B 1/02; A23C 3/02; F24C 15/34

U.S. Cl. 219—430 3 Claims



1. A yoghurt-making machine, comprising an enclosure having a cover, a receptacle having a bottom wall and a side wall disposed inside said enclosure, a basin fixed in said enclosure below said receptacle, said basin and said receptacle defining therebetween a space which is at least partly filled with a fusible material having a cooling curve exhibiting a solidification plateau at a temperature near to the optimum temperature of yoghurt formation, electrical heating means immersed in said fusible material, said basin having a bottom defining with the enclosure a closed chamber completely separated from said fusible material by said bottom of said basin, a temperature limiting element connected with the heating means and disposed in said chamber in spaced relation to the walls thereof so as to be responsive to only the temperature of the air within said chamber, said temperature limiting element being operative to stop the heating of said fusible material when the temperature in the chamber is significantly higher than that of the solidification plateau of said fusible material, the amount and the latent heat of solidification of said fusible material being sufficient for its solidification plateau to be maintained throughout the duration required for the formation of the yoghurt after heating has stopped.

4,009,369

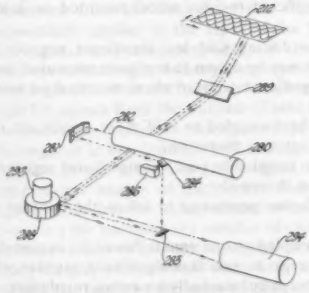
POLYPHASE SCANNER FOR BAR CODE SYMBOLS

Thomas D. Hayosh, Bloomfield Hills, and John H. Carosella, Avon Township, both of Mich., assignors to Schiller Industries, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 466,769, May 3, 1974, abandoned. This application Apr. 16, 1975, Ser. No. 568,808

Int. Cl.[2] G06K 7/14; G02B 27/17; G06K 9/10

U.S. Cl. 235—61.11 E 34 Claims



1. In a code reader for encoded packages bearing bar code symbols and passing across a scanning window, the code symbols having a rectangular code field, a scanner adapted to scan a reading field adjacent the window and having a transverse axis across which the code symbols are moved and having a longitudinal axis perpendicular to the transverse axis, said scanner comprising means for producing a light beam, deflection means, including optical means in the path of the light beam, first drive means operatively coupled with the optical means for cyclically deflecting the beam in the direction of the transverse axis as a linear function of time, and second drive means operatively coupled with the optical means for simultaneously cyclically deflecting the beam in the direction of the longitudinal axis as a sinusoidal function of time to produce a trace segment having a substantially sinusoidal waveform of uniform wavelength in the reading field for a cycle of deflection in the direction of the transverse axis, said deflection means including phase displacing means for displacing successive trace segments in the direction of the transverse axis by a controlled amount, whereby the trace segments produce a polyphase scan pattern on said window.

4,009,370

COUNTING OR INDICATING RING DEVICE

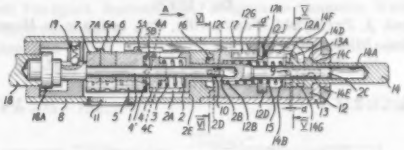
Kouichi Otsuka, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed June 10, 1975, Ser. No. 585,510

Claims priority, application Japan, June 10, 1974, 49-67188[U]

Int. Cl.[2] B43K 29/08; G06C 27/00, 15/42

U.S. Cl. 235—64 4 Claims

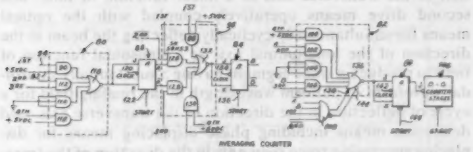


1. An indicating device comprising: indicating rings rotatably supported by a shaft, each of said rings having numerals or marks on a pitch circle thereof, step advancing means spaced adjacent to one of said rings to advance it step by step, operating means arranged parallel to the ring axis and longitudinally movable to operate said step advancing means relative to the indicating rings, a stopping bar arranged close to the indicating ring peripheries and engageable with a lug formed on the periphery of each of said indicating rings, means including a changeover sleeve for engaging and disengaging said operating means with the step advancing means, and means including a rotatable and slidable knob having two functions, one being to shift said stopping bar to stop the indicating rings in response to pushing-in of the knob so that said shaft can be rotated, accompanying the indicating rings with frictional torque, by rotation of the knob to effect an indicating ring resetting function, and the other being to rotate said change-over sleeve to an angular position to permit or prevent the engagement of said operating means with the step advancing means in response to rotation of the knob without pushing-in to effect a change-over function, said shaft being provided with a click-stop to stop the shaft at a predetermined angular position thereof thereby preventing the shaft from being rotated over with unexpected torque caused by knob misoperation or other accidents.

4,009,371
AVERAGING COUNTER

Robert H. Hamilton, and John L. Mohr, both of St. Louis County, Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 3, 1975, Ser. No. 554,750
Int. Cl.² H03K 21/30
U.S. Cl. 235—92 LG 12 Claims

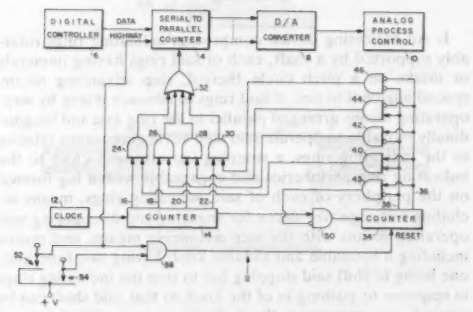


1. Means to control a counter to simultaneously count and average comprising a multi-stage counter of M stages, each stage having input and output connections, said means including control gate means, the inputs of stage 1 through M having connections to said control gate means and the outputs of stages 1 through M−1 having connections to said control gate means, enable/inhibit means including start and stop inputs to enable or inhibit selected counter stages, said gate means and said enable/inhibit means, controlling the counter to cause the counter stages to count at a first preselected counting rate in response to receipt of a start signal at said start input, said enable/inhibit means connecting signals at said stop input thereof to said control gate means to effect a change in the counting rate of the multi-stage counter, said control gate means including means to selectively terminate the counting operation of predetermined counting stages upon receipt of a predetermined number of signals at said stop signal input.

4,009,372
MANUAL OVERRIDE USING A VARIABLE CLOCK FREQUENCY IN A CONTROL SYSTEM EMPLOYING A D/A CONVERTER TO TRANSLATE DIGITAL CONTROL SIGNALS FROM A DIGITAL COMPUTER TO ANALOG SIGNALS FOR OPERATING PROCESS CONTROL DEVICES

Frank J. Przybylski, Feasterville, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 12, 1975, Ser. No. 557,791
Int. Cl.² G06M 3/00
U.S. Cl. 235—92 CC 3 Claims



1. A variable speed analog signal incrementation circuit to provide a time dependent incrementation speed variation for a manual override in a control system comprising

storage means for storing a digital word,

input means for entering a digital word in said storage means,

digital-to-analog signal converter means for converting the stored digital word to an analog output signal, and

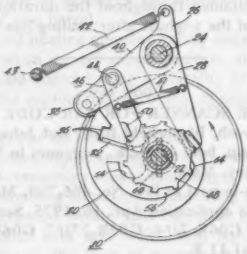
variable frequency signal generator means connected to said storage means for selectively incrementing the stored digital word by applying a variable frequency output signal to said storage means, said variable frequency generator means having a variable frequency mode of operation, said variable frequency signal generator means including means for generating a plurality of differing fixed frequency output signals including a fixed frequency clock means and a counter means for counting output signals from said clock means to produce a plurality of subdivided fixed frequency output signals as the plurality of differing fixed frequency output signals, gating means for sequentially applying said plurality of fixed frequency output signals to said storage means according to a predetermined pattern encompassing said fixed frequency output signals and gating means including a second counter means arranged to count an output signal from said first counter means and means for decoding count states of said second counter means connected to said counter means and responsive to output signals from said counter means to produce control signals for said gating means to apply said variable frequency output signals to said storage means according to said pattern, and

selectively operable reset means connected to said variable frequency signal generator means for selectively interrupting the operation of said signal generator means to terminate the incrementation of said stored digital word and for selectively restarting the operation of said generator means following such an interruption at a predetermined one of said fixed frequency output signals which is the lowest frequency signal of said fixed frequency output signals.

4,009,373
ELECTRO-MECHANICAL COUNTING REGISTER

Einar T. Young, Largo, Fla., assignor to Suntech, Inc., St. Davids, Pa.

Filed Dec. 11, 1975, Ser. No. 640,104
Int. Cl.² G06M 1/30, 1/16
U.S. Cl. 235—92 FL 7 Claims



1. An approved register comprising:

a main shaft;

b. a less significant register wheel mounted on said main shaft;

c. means for driving said less significant register wheel, whereby it may be driven to register a measured quantity;

d. a more significant register wheel mounted on said main shaft;

e. a drive wheel coupled to said more significant register wheel for rotation therewith;

f. a snail cam coupled to said less significant register wheel for rotation therewith;

g. a cam follower positioned to follow the contour of said snail cam;

h. a spring coupled to said cam follower for accumulating a storing energy as said less significant register wheel is driven through substantially an entire revolution;

i. a driving pawl coupled to said drive wheel and said cam follower for driving said more significant register wheel

through a predetermined portion of a revolution after said less significant register wheel has substantially completed one revolution;

j. a restraining pawl, coupled to said drive wheel, for restraining rotational movement of said more significant wheel unless said driving pawl is driving said more significant register wheel;

k. a first reset cam, coupled to said main shaft for rotational movement therewith and also coupled to said driving and restraining pawls, for lifting said driving and restraining pawls upon rotation of said main shaft during a resetting operation; and

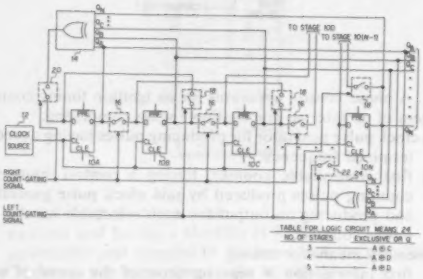
l. means for resetting the register to zero and including means for rotating said main shaft during a resetting operation, whereby said reset cam will lift said driving and restraining pawls from said drive wheel during the resetting operation.

4,009,374

PSEUDO-RANDOM BIDIRECTIONAL COUNTER

H. Scott Taylor, Newport Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 17, 1976, Ser. No. 687,416
Int. Cl.² H03K *23/30;* **H03B** *29/00*
U.S. Cl. 235—92 SH **9 Claims**



1. A pseudo-random bi-directional counter, comprising:

a source of clock pulses;

a plurality of flip-flops for sequential interconnection to function as a shift register, the output signal of each flip-flop being transferred to the input of an adjacent flip-flop in response to each clock pulse;

switching circuit means for connecting the output of each flip-flop to the input of the next succeeding flip-flop in response to a right count gating signal or to the input of the next preceding flip-flop in response to a left count gating signal;

first logic circuit means for generating a first repetitive logic bit stream from the outputs of said flip-flops which is sequentially applied to the input of the first flip-flop of said register in synchronism with said clock pulses in the presence of said right count gating signal, and

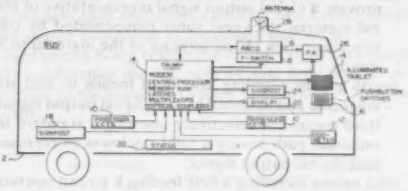
second logic circuit means for generating a second repetitive logic bit stream from the outputs of said flip-flops which is sequentially applied to the input of the last flip-flop of said register in synchronism with said clock pulses in the presence of said left count gating signal, said bit streams being mirror images of each other and applied to the register such that the binary output of said register after advancing the count by any number of clock pulses in the presence of one of said gating signals is the same as the binary output which would have been obtained by regressing the count by the same number of clock pulses in the presence of the other one of said gating signals.

4,009,375

MONITORING SYSTEM FOR VEHICLES

Howard S. White, Toronto, and Leonard Casciato, Downsview, both of Canada, assignors to Peat, Marwick and Partners, Toronto, Canada

Filed May 5, 1975, Ser. No. 574,827
Claims priority, application Canada, May 13, 1974, 199661
Int. Cl.² G08G *1/09;* **G06F** *15/50*
U.S. Cl. 235—150.24 **9 Claims**



1. A closed loop vehicle monitoring and control system including a central control station and one or more vehicles to be monitored during movement along a path of travel,

a transit universal micro processor unit and one or more peripheral devices mounted on each vehicle, each peripheral device being interchangeably connected with the microprocessor unit for the flow of information therebetween,

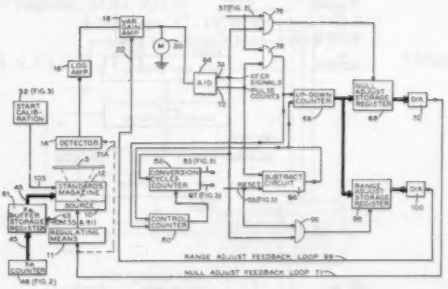
a two-way radio communication data information link between each vehicle and the central control station whereby information as to the vehicle can be received at said central control station from said vehicle, said control station analysing said information and preparing correspondingly modified instructions for said vehicle, said control station then transmitting said modified instructions to said vehicle.

4,009,376

METHOD AND APPARATUS FOR MEASURING MATERIAL THICKNESS

Claude Faraguet, Summit, Pa., assignor to Sangamo Weston, Inc., Archbald, Pa.

Continuation of Ser. No. 226,457, Feb. 15, 1972, abandoned. This application Feb. 5, 1975, Ser. No. 547,160
Int. Cl.² G01N *23/16;* **G01T** *1/16*
U.S. Cl. 235—151.3 **66 Claims**



6. A thickness measuring gauge comprising, a source of radiation, a standards magazine mounting a plurality of radiation-attenuating standards of predetermined thickness values, each of said standards being movable into a path of said radiation in response to a signal representative of a selected standard thickness, detection means mounted in said path of radiation for providing an analog electrical signal output having a magnitude which is a function of the radiation absorption characteristic of the material in said path,

an analog meter coupled to said detection means for providing a visual display of changes in analog signal mangitude;

first means programmable to provide a first signal representative of the nominal thickness of the material to be measured;

second means programmable to provide a second signal representative of differences in the radiation absorption characteristics of the material to be measured and the standards material;

third means responsive to said first and second signals to provide a digital output signal representative of the nominal material thickness value compensated by the radiation absorption characteristics of the material to be measured;

fourth means coupling said third means to said standards magazine and actuated by said digital output signal of said third means for selectively inserting a standard into said radiation path having a total thickness as represented by said digital output signal;

fifth means including a first feedback circuit operative with said standard in said radiation path for producing analog signal levels at the output of said detector means which tend to drive said meter to a null condition, said fifth means including a circuit which produces predetermined digital output signals when said condition obtains;

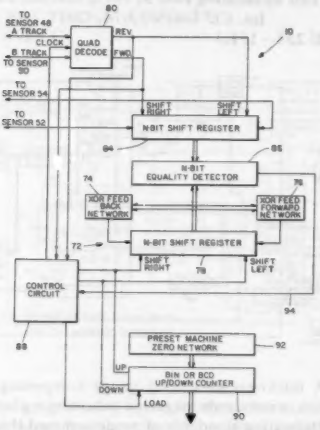
sixth means coupled to said fourth means and to said fifth means and responsive to said predetermined digital output signals of said fifth means for actuating said fourth means to insert another standard into said radiation path corresponding to a predetermined value of material thickness deviation from nominal, and

seventh means including a second feedback circuit coupling said circuit of said fifth means to said detection means and operative to drive said meter to indicate said predetermined value of thickness deviation.

4,009,377
POSITIONING DETERMINING METHOD AND APPARATUS

Ronald Duane Elms, 304 Orchard St., Chagrin Falls, Ohio 44022

Filed Nov. 7, 1975, Ser. No. 629,802
Int. Cl.² G06F *15/20*
U.S. Cl. 235—151.32 **33 Claims**

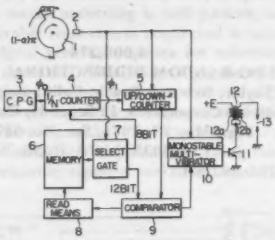


1. Method for determining the absolute position of a movable element mounted for movement along a path, said method including the steps of: developing a pseudo random sequence of indicia which uniquely define the position of the movable element on the path; generating a pseudo random sequence of information bits which correspond to the indicia; reading the pattern of N consecutive indicia at one particular position on the path as the movable element passes by said position; cycling the generated pseudo random sequence until N bits thereof equal the pattern of the N consecutive indicia read as the movable element passes by said position on the path; and when equality is obtained, generating a logic signal indicating that the pseudo random sequence has been cycled to a position correlated to the absolute position of the movable element on the path.

4,009,378
IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Shinichi Sakamoto, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 6, 1974, Ser. No. 530,280
Claims priority, application Japan, Dec. 7, 1973, 48-136046
Int. Cl.² G06F *1/02*
U.S. Cl. 235—152 **8 Claims**



1. A phase control apparatus for an ignition timing control system of an internal combustion engine comprising:

a clock pulse generator for producing pulses having a predetermined frequency;

a first controllable counter, having a control input, for counting pulses produced by said clock pulse generator and producing an output for each selectable number of pulses counted;

memory means for storing

first information X representative of the speed of said engine within a respectively defined engine speed band,

second information YU represenative of a first modulation coefficient which corresponds to a first number of pulses to be counted by said counter,

third information Yn representative of a second modulation coefficient which corresponds to a second number of pulses to be counted by said counter, and

a value Z corresponding to a final count;

input means for producing a first state signal $\alpha\pi$ and a second state signal $(1-\alpha)\pi$ in accordance with the rotation of said engine;

a second controllable counter for receiving the output pulses produced by said first controllable counter and the first and second state signals produced by said input means, and for counting up the output pulses from said first controllable counter during receipt of said first state signal $\alpha\pi$, and for counting down the ouput pulses from said first controllable counter during receipt of said second state signal $(1-\alpha)\pi$;

a controllable comparator for comparing the value X stored in said memory means with the count content of said second controllable counter and for generating an output signal when the count content of said second controllable counter becomes equal to said value X;

read means, coupled between said comparator and said memory, for shifting the readout address of said memory in accordance with the output signal from said comparator;

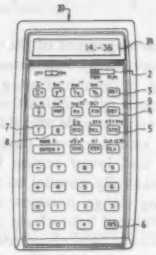
gate means, coupled between the output of said memory, the control input of said first controllable counter, and an input of said comparator, for applying said first information X from said memory means to said comparator in accordance with said first state signal $\alpha\pi$ from said input means, and for applying said second information Yn and said value Z from said memory means to said first controllable counter and to said comparator, respectively, in accordance with said second state signal $(1-\alpha)\pi$ from said input means; and

output means, coupled to said input means and said comparator, for generating an output control signal in accordance with the outputs of said comparator and said input means.

4,009,379
PORTABLE PROGRAMMABLE CALCULATOR DISPLAYING ABSOLUTE LINE NUMBER ADDRESSES AND KEY CODES AND AUTOMATICALLY ALTERING DISPLAY FORMATS

Bernard E. Musch, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 16, 1974, Ser. No. 533,430
Int. Cl.² G06F *15/04*
U.S. Cl. 235—156 **22 Claims**



13. A calculator comprising:

an input unit having a plurality of keys;

an encoder unit coupled to the input unit for generating a keycode corresponding to the actuated key;

a first memory unit coupled to the encoder unit for storing keycodes;

a second memory unit having stored microinstructions and being coupled to the encoder unit;

a computing unit, coupled to the encoder unit and the first and second memory units for performing operations employing microinstructions stored in the second memory unit in response to keycodes from the encoder unit and the first memory unit; and

output display means coupled to the computing unit for displaying the results of operations performed by the calculator in a first display format and for automatically altering the display format in response to a selected display condition to a second display format.

4,009,380
ELECTRO-OPTICAL SYSTEM FOR PERFORMING MATRIX-VECTOR MULTIPLICATION

Richard P. Bocker; Keith Bromley, both of San Diego; Michael A. Monahan, Poway, and Larry B. Stotts, Chula Vista, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 20, 1975, Ser. No. 542,524
Int. Cl.² G06F *7/56, 15/34*
U.S. Cl. 235—181 **8 Claims**

1. An electro-optical system for performing matrix-vector multiplication of the form

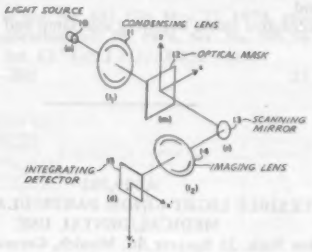
$$cm = \sum_{n=1}^{N} a_{mn}\, b_n \quad m = 1,2, \ldots M$$

comprising:

a mask of a plurality of elements disposed in a matrix of M rows and N columns, each such element a_{mn} having a substantially equal resolution area relative to all other like elements and containing recorded discrete information as defined by its degree of opacity representative of a predetermined mathematical value in a known matrix;

a light source positioned to illuminate said mask,

said light source being responsive to input signals for temporally modulating the intensity of said light source as a function of the sequential values of b_n in a N × 1 column vector;



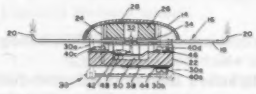
a multiple photo-responsive array including M elements disposed in a column and positioned to receive the light energy transmitted by the illuminated mask for generating signals at each element commensurate with the instantaneous photo energy received at its position; and

means synchronously responsive to said input signals and the modulation of the intensity of said light source for sequentially developing cumulative signals corresponding to the signal information contained in each column of said mask.

4,009,381
ILLUMINATED FIBER OPTIC JEWELRY

Sally Ann Schreiber, 4 Speridakas Terrace, Cambridge, Mass. 02139, and Thomas Walley Williams, III, 71 Orchard St., Belmont, Mass. 02178

Filed Sept. 12, 1974, Ser. No. 505,575
Int. Cl.² F21V *33/00*; G02B *5/14*
U.S. Cl. 240—1 EL **7 Claims**



1. A relatively flat, compact article of jewelry to be worn by a person comprising,

a battery holder operable to secure low voltage battery means,

an apertured, relatively thin matrix mounted generally adjacent said battery holder and having an aperture axis,

a plurality of individual, elongated, filamentary light-conducting fibers having major portions thereof arranged in a primarily planar array, said fibers having their converging inner ends embedded in said matrix and directed generally toward a central axis of said apertured matrix and their outer tips arranged to form a decorative pattern of dispersed small points of light and each of said fibers having a diameter in the range of 5 to 40 mils and being operable to minimize the loss of light conducted by the fibers through the sides of the fibers,

a lamp disposed at said axis of said matrix aperture generally adjacent the converging inner ends of said fibers to maximize the transmission of light from said lamp to the inner ends of said fibers,

a switch,

means for electrically connecting said battery means, said lamp and said switch,

means for supporting said article of jewelry on said person, and

a decorative shield overlying said lamp and said matrix.

4,009,382

FLEXIBLE LIGHT GUIDE, PARTICULARLY FOR MEDICAL/DENTAL USE

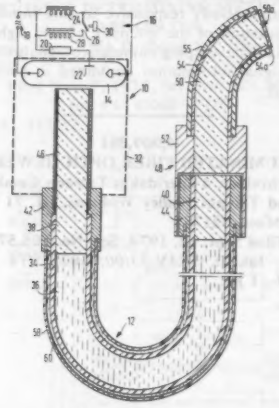
Günther Nath, 21 Speyrer St., Munich, Germany

Filed Feb. 3, 1975, Ser. No. 546,298

Claims priority, application Germany, Feb. 11, 1974, 2406424; May 21, 1974, 2424620; June 21, 1974, 2429859; July 11, 1974, 2433218

Int. Cl.² F21V 9/02

U.S. Cl. 240—1 LP **17 Claims**



1. For combination with an illuminating device, a flexible light guide which comprises

a flexible hollow tube of plastic material;

light transmissive means closing the tube at its ends;

and a light conducting liquid which has a refractive index greater than the refractive index of the plastic material of the tube and which completely fills the flexible tube between the light transmissive closing means to form a closed liquid light guide system;

wherein the liquid filling the tube has the characteristic that the liquid does not wet the plastic material of the flexible tube; and

wherein the liquid filling the tube has the characteristic that the liquid is hygroscopic.

4,009,383

LIGHT CHUTE ARRANGEMENT

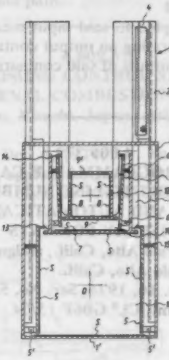
Siegfried Beier, Munich, Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Germany

Filed Oct. 22, 1975, Ser. No. 624,977

Claims priority, application Germany, Oct. 31, 1974, 2451892

Int. Cl.² G03B 15/02, 27/54

U.S. Cl. 240—1.3 **10 Claims**



4. A light chute arrangement of the type having reflective inner surfaces for conveying light from a light source to an original, comprising, in combination, a first light chute component having an open side; at least one further light chute component having an open side and side walls laterally opposite said open side, said side walls having a lower region and being mounted at said lower region for pivotal movement about an axis substantially parallel to the light path, and an upper region having flange portions which extend towards each other; an additional light chute component, the cross-section of said additional light chute component being smaller than the cross-section of said further light chute component which, in turn, is smaller than the cross-section of said first light chute component, each of said light chute components having reflective inner surfaces; and mounting means mounting said further light chute component for movement into and out of the interior of said first light chute component, and said additional light chute component for movement into and out of said further light chute component to selectably form from said light chute components light chutes of different respective cross-sections adapted to convey light to originals of different respective sizes.

4,009,384

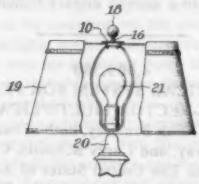
LAMP SCENT UNIT

Ada R. Holland, Atlanta, Ga., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 10, 1975, Ser. No. 556,888

Int. Cl.² A61L 9/02

U.S. Cl. 240—108 R **1 Claim**



1. A lamp shade holder mounted to a lamp assembly, with the lamp shade holder formed to fit about and over a lamp bulb mounted in said lamp assembly,

said lamp shade holder fitted with a post screw projecting from the said holder which screw projects from the holder away from a mounted lamp bulb, said screw adaptable for fitting into a finial hole of a lamp shade for attachment of the lamp shade to the said holder, together with

a container unit formed with a centrally located mounting hole of a size to fit about said post screw,

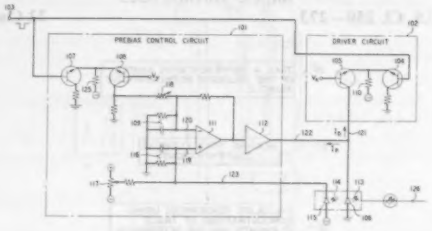
said container unit formed of a first sheet of porous material of high temperature-resistant and thermal insulation properties, which said first sheet is folded about an inner second sheet of porous material that is impregnated with a solution of scented material,

said central mounting hole passing through the said folded first sheet and the said folded second sheet.

4,009,385
LASER CONTROL CIRCUIT

Darrell Dean Sell, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 22, 1976, Ser. No. 668,824
Int. Cl.² H01S 3/10; H04B 9/00
U.S. Cl. 250—199 **6 Claims**



1. A control circuit for an injection laser, the circuit comprising:

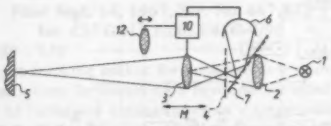
means for driving the laser in response to an electrical modulating signal, and

means for prebiasing the laser in response to the difference between a signal derived from the electrical modulating signal and a signal derived from the laser light output.

4,009,386
METHOD AND ARRANGEMENT FOR AUTOMATICALLY FOCUSSING AN OBJECTIVE ONTO A SUBJECT, USING AUTOCOLLIMATION

Reinhold Deml, Munich, and Ulrich Greis, Weyarn, both of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Germany

Filed Oct. 3, 1975, Ser. No. 619,396
Claims priority, application Germany, Oct. 5, 1974, 2447663
Int. Cl.² G01J 1/20
U.S. Cl. 250—201 **18 Claims**

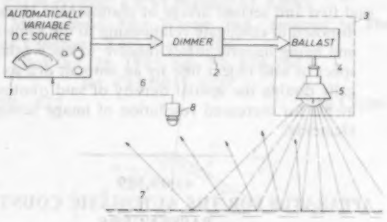


1. A method for automatically focussing onto a subject the objective of an optical apparatus provided with autocollimation lens means having a position bearing a predetermined relationship to the position of the objective, comprising the steps of so positioning a grating relative to the autocollimation path of the autocollimation lens means as to cause the latter to project an image of the grating onto the subject and to cause the image of the grating on the subject to be projected back onto the grating and into steady register with the grating structure to an extent dependent upon the degree of focus of the objective; using photoelectric means to derive from the light projected back onto the grating an electrical signal indicative of the extent to which the image of the grating projected back onto the grating is in steady register with the grating structure and accordingly indicative of the degree of focus of the objective; and controlling the operation of means for adjusting the setting of the objective by applying the electrical signal to such means.

4,009,387
AUTOMATIC ENERGY CONTROL LIGHTING SYSTEM WITH AUTOMATICALLY VARIABLE DC SOURCE

Eric L. H. Nuver, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.

Continuation of Ser. No. 581,270, May 27, 1975, abandoned. This application July 19, 1976, Ser. No. 706,567
Int. Cl.² G01J 1/32; H05B 41/36
U.S. Cl. 250—205 **22 Claims**



14. An automatically variable d.c. voltage source suitable for use with a lamp dimmer circuit that adjusts the light output of a lamp illuminating a work area in response to a variable d.c. bias, comprising:

a reference signal source producing a stable, continuous electrical signal level representative of a level of illumination desired over a work area;

photocell circuit means for detecting the level of illumination produced by a light source over a work area and producing a variable level signal representative of the level of illumination over the work area;

amplifier means connected to said reference signal source and said photocell circuit means for automatically producing a variable d.c. bias signal functionally related to the difference between the level of illumination over the work area and the desired illumination level for the work area; and

a buffer circuit to convert said variable d.c. bias signal to a higher signal level, said buffer comprising a controlled current source having a capacitor at its output to form an integrator that regulates the rate of change of the higher level d.c. bias signal to prevent rapid changes thereof in response to transient ambient stimuli.

4,009,388
ARRANGEMENT FOR EXTENDING PHOTOSENSOR ARRAY RESOLUTION

Ned J. Seachman, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

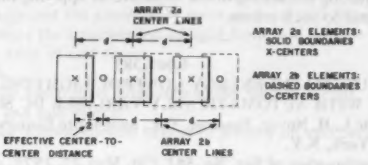
Filed Oct. 30, 1975, Ser. No. 627,499
Int. Cl.² H01J 39/12
U.S. Cl. 250—208 **3 Claims**

1. An optical system for projecting twin images of an object from an object plane to an image plane and for sensing said image at said image plane, including:

a projection lens disposed on an optical axis between said object plane and said image plane to project an image of an object from said object plane to said image plane,

a beam splitter disposed on said optical axis between said projection lens and said image plane to partially transmit said image toward a first image plane and to partially reflect said image toward a second image plane, said first and second image planes thus being twin image planes in optical superposition,

a first linear array of photosensor elements disposed in said first image plane, said elements being separated by a center-to-center spacing *d*,


ARRAY 2a CENTER LINES
ARRAY 2a ELEMENTS: SOLID BOUNDARIES X-CENTERS
ARRAY 2b ELEMENTS: DASHED BOUNDARIES O-CENTERS
EFFECTIVE CENTER-TO-CENTER DISTANCE
ARRAY 2b CENTER LINES

a second linear array of photosensor elements disposed in said second image plane, said elements being separated by a center-to-center spacing *d*,

said first and second arrays of photosensor elements being disposed in conjugate relationship to the same object line and being linearly offset relative to each other with respect to said object line by an amount *d*/2 so as to optically double the spatial density of said photosensor elements for increased resolution of image sensing by said elements.

4,009,389
APPARATUS FOR THE AUTOMATIC COUNTING OF PASSENGERS

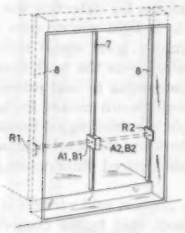
Ulf Lindholm, Trangsund, Sweden, assignor to Aktiebolaget Almex, Stockholm, Sweden

Filed Sept. 19, 1975, Ser. No. 614,865

Claims priority, application Sweden, Sept. 26, 1974, 7412121

Int. Cl.² G01D *21/04*

U.S. Cl. 250—221 **10 Claims**



1. Apparatus for automatically counting persons entering and leaving a public transportation vehicle having at least two passenger doorways provided with doors, each doorway being the width of an adult person and each doorway being adapted for entry and egress of passengers, comprising: per doorway, two emitters of invisible light adapted to emit a pair of pulsed parallel beams of said light in a horizontal plane across said doorway, the distance between said parallel beams being less than the thickness of an adult person, said plane being about the height of the hip of an adult in said doorway; two beam sensors of said light, each adapted to sense an interruption in said pulsed invisible light beam transmitted thereto; a reflector of invisible light positioned across said doorway opposite said emitters and adapted to reflect one of said beams to one of said sensors and to reflect the other beam to the other sensor, said sensors being visible from said reflector; electronic means cooperating with each of said sensors to emit a pulse of electric current for each interruption of the pulsed invisible light beam thereto; electronic pulse sensing means adapted to receive the pulses emitted from each of said sensors and to distinguish between and to separately register pulse pairs produced by interruption of the first beam of said pair of beams before interruption of the second beam of said pair and between pulse pairs produced by interruption of the second beam of a pair of beams before interruption of the first beam of said pair, thereby distinguishing between pulse pairs produced by persons passing inwardly through the doorway and pulse pairs produced by persons passing outwardly through said doorway; means for separately registering and storing said inward and said outward pulses separately for each doorway of said vehicle; and switch means cooperating with said doors to supply electric current to said apparatus only when said doors are open.

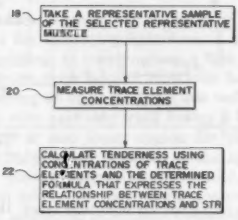
4,009,390
PROCESS FOR MEASURING TENDERNESS OF COOKED MEAT

Lowell Duggan Satterlee; Roy Gary Arnold, both of Lincoln, and Philip C. Anderson, Crete, all of Nebr., assignors to The Regents of the University of Nebraska, Lincoln, Nebr.

Filed Oct. 23, 1975, Ser. No. 625,251

Int. Cl.² G01M *23/223*

U.S. Cl. 250—273 **22 Claims**


18
TAKE A REPRESENTATIVE SAMPLE OF THE SELECTED REPRESENTATIVE MUSCLE
20
MEASURE TRACE ELEMENT CONCENTRATIONS
22
CALCULATE TENDERNESS USING CONCENTRATIONS OF TRACE ELEMENTS AND THE DETERMINED FORMULA THAT EXPRESSES THE RELATIONSHIP BETWEEN TRACE ELEMENT CONCENTRATIONS AND STR

1. A process for evaluating the tenderness of meat comprising the steps of measuring the concentration of at least two of several trace elements in the meat and correlating the concentrations of said trace elements as independent variables of a functional relationship having tenderness as the dependent variable.

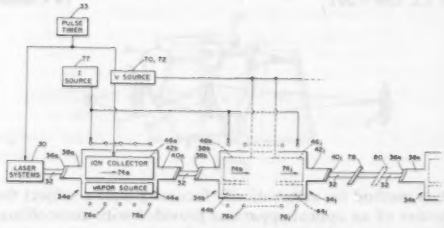
4,009,391
SUPPRESSION OF UNWANTED LASING IN LASER ISOTOPE SEPARATION

George Sargent Janes, Lincoln; Richard H. Levy, Boston, both of Mass., and Lawrence A. Levin, Beer Sheva, Israel, assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed June 25, 1974, Ser. No. 482,866

Int. Cl.² H01J *37/08, 39/34*

U.S. Cl. 250—281 **29 Claims**



1. A system for limiting deexcitation losses by self lasing in a column of particles excited for subsequent further energization, said system comprising:

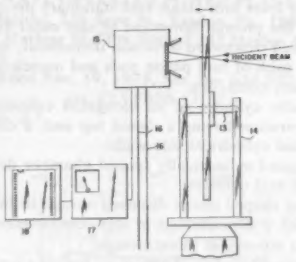
means for defining said column of particles;
means for applying radiation to said column of particles to produce excitation of particles in said column to at least one excited energy level;
the column of said particles having at least one population inversion between an excited and lower level with a gain sufficient to produce self lasing of said column of particles; and
means associated with said column of particles for reducing deexcitation thereof by self lasing.

4,009,392

RADIATION FOCUS METER

Stephen T. Hanley, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,251
Int. Cl.² G01J 1/00
U.S. Cl. 250—338 6 Claims



1. A method of determining the focal point of a convergent radiation beam which comprises,
scanning said radiation beam with a scan means perpendicular to said radiation beam,
permitting only a small percentage of said radiation to pass through said scan means,
positioning a radiation detector means at a fixed distance from said scan means for detecting radiation that passes through said scan means,
moving said radiation detector means in unison with said scan means to a position at which said radiation detector means has the greatest output,
whereby the position for greatest output denotes the focal point of the incident radiation.

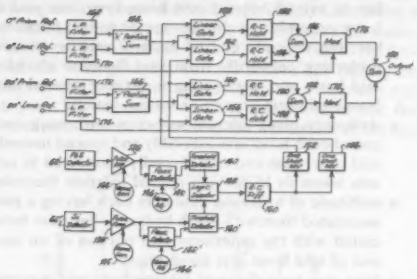
4,009,393

DUAL SPECTRAL RANGE TARGET TRACKING SEEKER

Glen W. Ashley, Jr., Walnut; Ernest O. Buenting, Upland; Charles A. Leonard, Pomona, and Gerhard Lessman, Chino, all of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Sept. 14, 1967, Ser. No. 667,822
Int. Cl.² G01J 1/00; F41G 7/00
U.S. Cl. 250—339 17 Claims

1. A target tracking seeker for an air vehicle comprising:
a. optical means for receiving a first and a second spectral range of radiations emanating from a target, said optical means including two optically decentered elements;
b. means for individually rotating the two optically decentered elements of said optical means with respect to each other to produce a substantially point image for said first and said second spectral range radiations, said rotating means operably associated with said optical means;
c. means for detecting the substantially point image of said first and said second spectral range radiations to produce a first signal indicative of the first spectral range image, and a second signal indicative of said second spectral



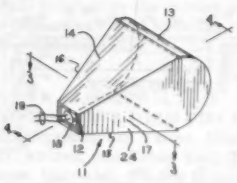
range image, said detecting means operably associated with said optical means.

4,009,394

REMOTE CONTROL LIGHT TRANSMITTER EMPLOYING A CYLINDRICAL LENS

Eugene P. Mierzwinski, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 28, 1975, Ser. No. 626,164
Int. Cl.² H01L 9/00
U.S. Cl. 250—552 16 Claims



12. A lens for transmitting light formed of optical material and having a front light receiving surface, planar side surfaces, a planar top surface, a planar bottom surface, and a rear surface, said front surface being cylindrical about an axis of curvature, said side surfaces subtending the length of said front surface and said top and bottom surfaces subtending the arc of said front surface, said side surfaces being convergent toward a first line located rearwardly of said front surface, and said top and bottom surfaces being convergent toward a second line located rearwardly of said rear surface, and said rear surface having a cavity therein for receiving a light emitting diode.

4,009,395

WAVE AND TIDE ACTUATED HYDRAULIC ELECTRICAL GENERATING APPARATUS

Charles S. Long, and Jamesina Long, both of Winesap Road, Rte. 8, Box 303, Jonesboro, Ark. 72401

Filed Nov. 4, 1974, Ser. No. 520,640
Int. Cl.² F03B 13/12
U.S. Cl. 290—53 1 Claim

1. A wave and tide actuated hydraulic electrical generating apparatus comprising, in combination:
a hollow basin area connected with a source of water having a fluctuating water level;
a gate interposed between said basin and said source of water and operable between an open and closed position for retaining and releasing water from said basin area;
a flotation chamber disposed in said basin and floatingly supported on said water level, said chamber movable upwardly and downwardly on said water level;
a multitude of substantially identical lever arm assemblies

disposed longitudinally spaced apart from each other completely along said flotation chamber and projecting outwardly over opposite portions of said flotation chamber to extend beyond said basin area, one end of each lever assembly movably connected to said flotation chamber, the opposite end of each of said lever assemblies projecting outwardly from said flotation chamber over said basin and terminating a distance spaced outwardly from said basin area in an outermost end;

a stationary pivot fulcrum associate with each outermost end of each lever arm assembly and spaced inwardly from said outermost end and pivotally connected to said lever arm assembly to provide pivotal rotation thereabout;

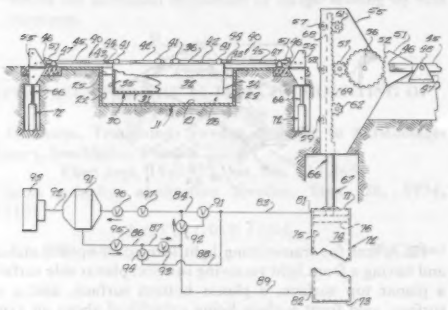
a multitude of hydraulic cylinders each having a piston rod associated therewith, each hydraulic cylinder being associated with the outermost end portion of an associated one of said lever arm assemblies;

a drive gear train disposed intermediate said outermost end of each lever arm assembly and said piston rod of each associate hydraulic cylinder for effecting reciprocal movement of said piston rod in said cylinder upon pivotal movement of said outermost end member about said stationary pivot fulcrum, and including means to increase the magnitude of the stroke of the piston rod with respect to the fluctuation of the water level;

hydraulic fluid disposed in said hydraulic cylinder chamber;

a hydraulically powered turbine;

suitable hosing connecting said multitude of hydraulic cylinders in parallel hydraulic relationship;



suitable hosing connecting said parallel connected cylinders to each hydraulic turbine for driving the same by transmitting hydraulic fluid therethrough from said cylinder through said turbine and back to said cylinders;

a pressure control valve disposed in said hosing for maintaining accurate flow of the fluid pressure therethrough to assure a constant pressure and volume of fluid to be delivered to said hydraulic turbine;

a first valve associated with an inlet to said turbine being of a one-way valve construction only permitting fluid to enter said inlet;

a second valve associated with an outlet of said turbine and being of a one-way structure to only permit fluid to exit from said outlet;

valve means associated with said hosing to provide for fluid direction from said hydraulic cylinders to said turbine in a manner such that fluid always enters said inlet and exits from said outlet during both the inward and outward stroke of said piston rod from said associated cylinders; and

an electrical generator mechanically connected to a shaft of said hydraulic turbine to be drivingly rotated thereby for generation of electrical energy;

wherein said flotation chamber is of a rectangular box-like configuration having a flat bottom surface, a flat top surface, opposed side wall surfaces, and opposed end wall surfaces; said flotation chamber being floatingly supported in said basin area; and

wherein said lever arm assemblies each comprise:

a pair of laterally spaced apart collar members affixed to said flotation chamber top surface;

a first lever arm slidingly received through said collar members for lateral sliding reciprocal movement relative thereto and having an inner end and an outer end, said inner end disposed inwardly of said flotation chamber with said outer end projecting laterally outwardly over a side edge of said flotation chamber and inwardly of said basin area;

a second lever arm of an elongated rigid structure having an inner end and an outer end;

pivot means connecting said second lever arm inner end to said first lever arm outer end;

said stationary pivot fulcrum mounted outwardly of said basin area in longitudinal alignment with said first and second lever arms and spaced inwardly of said outer end of said second lever arm and pivotally secured thereto for pivotal support thereof;

vertical upward and downward movement of said flotation chamber effecting lateral sliding movement of said first lever arm which, in turn, effects pivotal movement of said second lever arm about said stationary pivot fulcrum to effect the pivotal movement of said outer end in an upward and downward direction thereabout; and

wherein each of said piston rods and associated hydraulic cylinders comprises:

a hydraulic cylinder of an elongated cylindrical vertical configuration having a closed top end, a closed bottom end, and cylindrical side walls;

an elongated cylindrically spaced chamber defined interiorly of said cylinder;

a flat disc shaped piston disposed normal to the axis of the cylinder and positioned in said compartment for sliding guided movement therethrough;

an elongated rod shaped piston rod having a top end portion and a bottom end portion;

said bottom end portion being of a solid cylindrical configuration having its bottom end affixed concentrically to said piston and projecting outwardly of said cylinder top end and terminating at a juncture point with said top end portion;

said top end portion being of a flattened stock material having a flat back surface and a flat front surface diametrically opposed to said back surface;

said flat front surface provided with a continuous row of a rack of gear teeth completely therealong to the top end thereof;

a first valve disposed in said cylinder adjacent said top end thereof and in communication with said compartment;

a second valve disposed in said cylinder adjacent said bottom end thereof and in communication with said compartment;

said cylinder being of a double-acting cylinder type for pumping hydraulic fluid from said cylinder compartment on both a downstroke and upstroke of said piston;

and further characterized by a vertically disposed supporting bracket associated with each of said piston rods, each of said lever arm outer ends, and each of said drive gear trains;

a vertically aligned spaced apart series of roller guides rotatively affixed to said bracket with said rollers in guiding roller engagement with said back surface of said piston rod for guiding the vertical reciprocal movement of said piston and top end portion therealong;

a pair of tooth pinion gears rotatively affixed to said bracket in vertical alignment with each other and spaced horizontally from said roller guides, said teeth of said pinion gears engaging said rack teeth on said front surface of said top end of said piston rod to guide the same therealong and retain said piston rod captured for accurate vertical reciprocal movement between said pinion gears and said roller guides;

a first drive gear having gear teeth about its periphery in

meshing engagement with said rack of teeth on said piston rod and disposed intermediate said pinion gears;

a second drive gear having gear teeth about its periphery disposed in meshing engagement with said teeth of said first drive gear;

an arcuate segment gear affixed to said outer end of said second lever arm along a diametric axis thereof and having a row of gear teeth disposed along the arcuate outermost periphery thereof, said segment gear teeth being disposed in meshing engagement with said gear teeth of said second gear;

said first and second gears being of a size relative to each other to receive a small movement of said segment gear and increase the effectiveness of said movement when driving said top end portion of said piston rod in a manner to provide said increase of the magnitude of the stroke of said piston rod relative to the fluctuation of the water level.

4,009,396

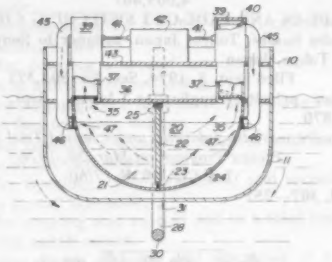
WAVE OPERATED POWER PLANT

Henry A. Mattera, 736 Fern St., Yeadon, Pa. 19050; Paul F. Pitts, and Marlene M. Pitts, both of 245 Merion Ave., Aldan, Pa. 19018

Filed Nov. 19, 1975, Ser. No. 633,397

Int. Cl.² F03B *13/12*

U.S. Cl. 290—53 **4 Claims**



1. A wave operated power plant which comprises a vessel having a hull

a chamber carried within said hull, and having a quantity of liquid therein,

a vertically extending pipe extending upwardly from the top of said chamber for liquid delivery,

liquid actuated motive power means to which said pipe is connected,

a return pipe connected to said motive power means for the return of the liquid to said chamber,

electric generator means driven by said motive power means,

a sweep rotatably mounted within said chamber by a shaft extending the length of said vessel, which sweep forces the water into said pipes by motion of said vessel, and

weight means carried by said shaft under said vessel.

4,009,397

LOGIC CIRCUIT

Cornelis Mulder, Beekbergen, and Henricus Elisabeth Jozef Wulms, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

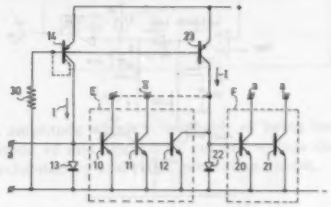
Filed Aug. 6, 1975, Ser. No. 602,472

Claims priority, application Netherlands, Nov. 1, 1974, 7414273

Int. Cl.² H03K *19/08*

U.S. Cl. 307—203 **6 Claims**

1. A logic gate circuit, comprising a first group of transistors each having emitter, base and collector, means connecting in parallel one of the base-emitter and collector-emitter paths of the transistors in the first group, a second group of transistors each having emitter, base and collector, means connecting in parallel the base-emitter paths of the transistors in the second group to the collector-emitter path of at least one of the transistors of the first group, a current source for biasing the transistors of the first group and coupled to a common connection point of the emitters of the transistors of the first group, a current source for biasing the transistors of the sec-



ond group and coupled to a common connection point of the emitters of the transistors of the second group, each of the bases of the transistors of the first and the second group being connected respectively to the current source for the transistors of the first and the second group, and means providing between the base and the emitter of each of the transistors of the first and second groups a current path for sinking a part of the current which is supplied by the current source which is connected to the base of each said transistor when each said transistor is in the conductive state.

4,009,398

SAWTOOTH WAVE FORM CIRCUIT

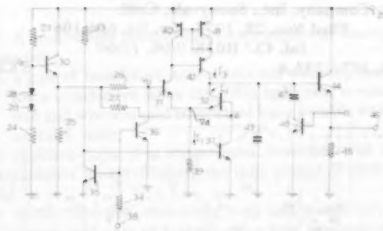
Kouichi Yamada, Higashiosaka; Tatsuo Mizota, Kadoma; Kiyoshi Takeda, Katano, and Kunio Aoki, Toyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 30, 1975, Ser. No. 582,192

Claims priority, application Japan, June 4, 1974, 49-63554

Int. Cl.² H03K *4/08, 4/48*

U.S. Cl. 307—228 **2 Claims**



1. A sawtooth wave forming circuit which comprises a first and a second transistor connected as a differential amplifier, a bias source coupled to the bases of the first and the second transistors, which determines base current and voltage applied on the transistors, a switching circuit connected to the differential amplifier for alternately giving to the first and the second transistors the base current and voltage from the base source, a constant current circuit connected between a power source and the collectors of the differential amplifier for letting flow in the second transistor a current equal to or proportional to the current flowing in the collector of the first transistor, and a capacitor connected between ground and the connection between the constant current circuit and the second transistor of said differential amplifier, whereby the charge-discharge of the capacitor is controlled by means of the current and voltage from the bias source.

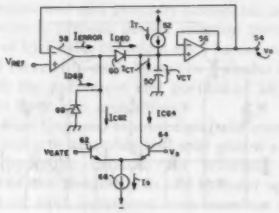
4,009,399
GATED RAMP GENERATOR

Bruce Edward Hofer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 512,633, Oct. 7, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,584

Int. Cl.² H03K *4/08*

U.S. Cl. 307—228 **5 Claims**



1. A gated ramp voltage generator, comprising:
a current source for providing a first current;
capacitor means connected to said current source for developing the ramp voltage thereacross in response to current applied thereto;
comparator means having a first input coupled to receive the ramp voltage and a second input connected to a reference voltage source, said comparator means producing a second current at the output thereof which is proportional to the difference in amplitude between the ramp voltage and said reference voltage; and
current steering means coupled to both said capacitor means and said comparator means for steering to said capacitor means said first and said second currents to produce the ramp voltage, said current steering means including means for gating said first and said second currents to cause the ramp voltage developed to be a gated ramp voltage.

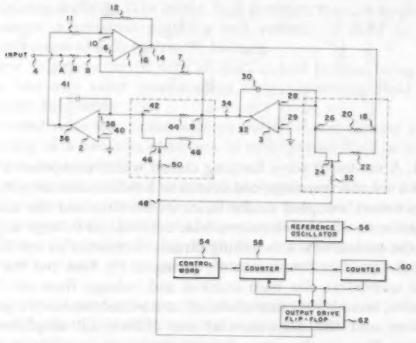
4,009,400
DIGITALLY CONTROLLED VARIABLE CONDUCTANCE

Richard Wayne Harris, Stockton, and Harry Thomas Lee, Sunnyvale, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Nov. 28, 1975, Ser. No. 636,106

Int. Cl.² H03K *9/06, 17/60*

U.S. Cl. 307—233 A **5 Claims**



1. The digitally controlled variable conductance comprising:
a first resistance means connected between said first and second terminal;
a second resistance means and a switching means, said second resistance means and said switching means connected in series and connected between said first and second terminal;
said switching means further defined as including a control terminal;
digital means operatively connected to said control terminal to control the conductance of said variable conductance;
said digital means includes a means for receiving a control word, a reference oscillator, a first counter, a second counter, and an output drive flip-flop;
said reference oscillator connected to said first and second counters to provide a reference timing;
said second counter generating an on signal that sets the said flip-flop to a conductive state and triggers said first counter to load the control word, whereby said switching means is turned on when said flip-flop is in the conductive state and is turned off when the first counter counts down to zero.

4,009,401
FADE-IN AND FADE-OUT SWITCHING CIRCUIT

Masanobu Sasaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

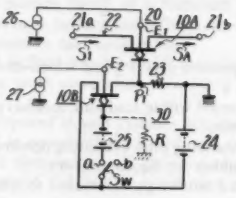
Filed Sept. 5, 1974, Ser. No. 503,371

Claims priority, application Japan, Sept. 7, 1973, 48-100870

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² H03K *17/60*

U.S. Cl. 307—251 **8 Claims**

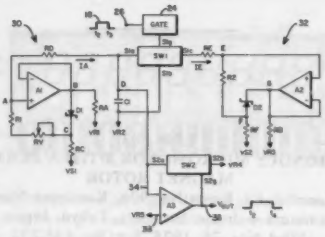


1. A switching circuit comprising first and second semiconductor devices each including a semiconductor substrate having a current path portion, first and second semiconductor regions forming a PN-junction therebetween, said first region being capacitively coupled to said current path portion, a control electrode connected to said second region, first and second terminals electrically connected to both ends of said current path portion respectively, a signal input terminal electrically connected to said first terminal of said first semiconductor device, an output terminal electrically connected to said second terminal of said first semiconductor device, means for connecting said control electrode of said first semiconductor device to said first terminal of said second semiconductor device, means for applying a bias voltage to said second terminal of said second semiconductor device, switch means for selectively applying a bias voltage to said control electrode of said second semiconductor device and neutralization means operative on at least one of said first and second semiconductor devices for injecting carriers into said first region of said device to independently control a fade-in and fade-out time.

4,009,402
TIME EXPANDER CIRCUIT FOR A FREQUENCY-TO-DIGITAL CONVERTER

Floyd V. Miller, Richfield, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,143
Int. Cl.² H03K 1/18, 17/60
U.S. Cl. 307—267 3 Claims



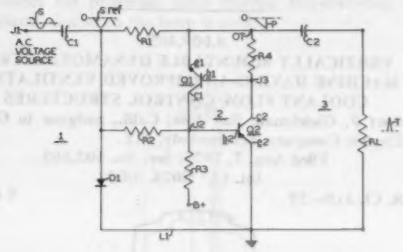
1. A time expander circuit, comprising:
a current source;
a current sink;
first switch means;
second switch means;
capacitor means;
means for continuously coupling said current source to a first node;
means for coupling a first terminal of said capacitor means to said first node;
means for coupling a second terminal of said capacitor means to a first reference voltage;
means for coupling a first terminal of said first switch means to said first reference voltage;
means for coupling a second terminal of said first switch means to said first node;
means for coupling a first terminal of said second switch means to said first node;
means for coupling said current sink to a third terminal of said first switch means;
comparator means coupling said first node to a second reference voltage for establishing the maximum voltage potential of said first node at said second reference voltage;
means coupling a gating pulse, having a duration T, to a fourth terminal of said first switch means for selectively closing said first switch means only during said duration T and selectively switching said current sink from said first reference voltage to said first node only during said duration T;
said gating pulse of duration T controlling said comparator means for generating, at an output terminal of said comparator means, an output signal V_{OUT} whose duration **0** is a predetermined, time expanded multiple of said gating pulse duration T.

4,009,403
LOW GAIN PULSE GENERATING CIRCUIT

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 16, 1975, Ser. No. 578,350
Int. Cl.² H03K 5/01, 6/06
U.S. Cl. 307—268 10 Claims

1. A low gain pulse generating circuit comprising, a source of alternating current voltage, a bistable semiconductive trigger circuit having an input and an output including means for biasing said trigger circuit for operating said pulse generating circuit at near unity gain, said input of said semiconductive trigger circuit coupled to said source of alternating current voltage, and a differentiating circuit coupled to the output of said semiconductive trigger circuit for producing a narrow voltage pulse during one alternation of each cycle of said alternating current voltage, and said narrow voltage pulse

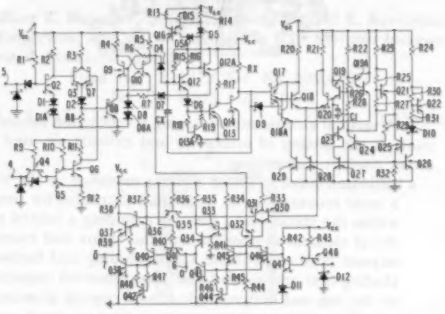


having an amplitude which is incapable of being larger than the magnitude of said alternating current voltage due to the low gain exhibited by said pulse generating circuit.

4,009,404
MONOSTABLE MULTIVIBRATOR HAVING MINIMAL RECOVERY TIME

James Ren-Jke Kuo, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Oct. 6, 1975, Ser. No. 619,752
Int. Cl.² H03K 3/10
U.S. Cl. 307—273 6 Claims



1. A monostable multivibrator with improved timing control comprising:
a. a pair of transistors interconnected whereby one transistor is conductive when the other transistor is nonconductive and wherein said transistors have a stable state and an unstable state,
b. resistive-capacitive means interconnected with said pair of transistors for establishing the time period of said unstable state,
c. means operably connected with said transistors for triggering said pair of transistors to said unstable state and effecting a discharge of said resistive-capacitive means, said pair of transistors reverting to said stable state when said resistive-capacitive means discharges to an established voltage level whereupon said resistive-capacitive means begins recharging,
d. voltage comparator means operably connected to said resistive-capacitive means for comparing the voltage charge of said resistive-capacitive means with a reference voltage and developing an output signal responsive to said comparison, and
e. means operably connected to said resistive-capacitive means for accelerating the discharge of said resistive-capacitive means whereby the recharge time period is much longer than the discharge time period, including a Darlington circuit interconnected with said means for

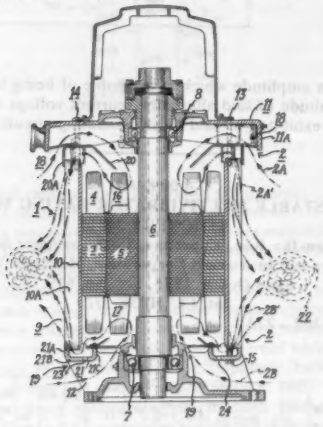
triggering and said resistive-capacitive means whereby said resistive-capacitive means discharges through said Darlington circuit.

4,009,405

VERTICALLY MOUNTABLE DYNAMOELECTRIC MACHINE HAVING AN IMPROVED VENTILATING COOLANT FLOW CONTROL STRUCTURES

Robert F. Gleichman, San Jose, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,605
Int. Cl.² H02K 9/00
U.S. Cl. 310—58 **9 Claims**



1. A vertical electric motor having a ventilation means that controls the mixing of intake air and exhaust air used as a motor coolant, comprising;

a laminated stator, a stator winding mounted on the stator, a rotor mounted on an axial shaft journaled for rotation within the stator, and a housing including a central cylindrical element disposed about the stator and extending beyond both ends of the stator winding and further including first and second end caps mounted respectively on the top and bottom ends of said central element.

a pair of generaly equivalent-volume fans mounted, respectively, on opposite ends of said rotor, said fans being effective when rotated to draw air into the housing through passageways formed at least partially by said end caps and being further effective to force air from the housing through exhaust ports,

a motor ventilation means comprising means defining first air inlet passageways between the top end cap and the central housing element, and means defining second air inlet passageways through the bottom end cap, said first air inlet passageways in combination being in the range of about 10 to about 60 percent larger in cross-sectional area than the combined cross-sectional area of said second air inlet passageways, said first air inlet passageways being arranged to receive air flowing axially upward along the top, outer end of said central housing element, and said second air inlet passageways being arranged to receive air flowing radially inward with respect to the bottom, outer end of the cylindrical surface of said central housing element, and first and second annular baffles mounted respectively adjacent the top and bottom ends of the central housing element to direct air forced from the housing to flow in generally axially directed streams along the exterior surface of said central housing element,

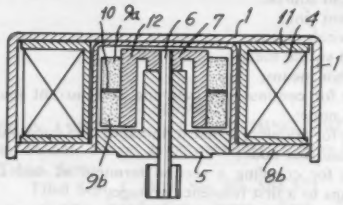
said ventilation means being effective to cause streams of air exhausted from the top and bottom ends of said motor to become mixed at a region adjacent the central housing element substantially closer to the bottom of the motor than to the top thereof, whereby a major portion of the turbulent hot exhaust air in said mixing region is prevented from undesirably pre-heating air entering the axially disposed inlet passageways adjacent the top of the motor.

4,009,406

SYNCHRONOUS MICROMOTOR WITH A PERMANENT MAGNET ROTOR

Tokuzo Inariba, c/o Room No. 906, Kamiuma Mansion, No. 2-9, Kamiuma 4-chome, Setagaya, Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,232
Int. Cl.² H02K 21/14
U.S. Cl. 310—164 **12 Claims**



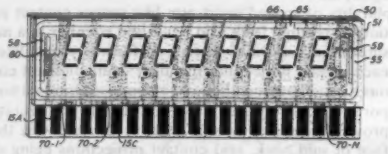
1. In a synchronous micromotor, an assembly forming an AC magnetic circuit having no gap, said assembly including annular coil means coaxially surrounding a predetermined axis, a casing of soft magnetic material having a transverse wall extending perpendicularly across said axis and a cylindrical wall extending from a peripheral edge of said transverse wall and surrounding said coil means, and an inner cylindrical stator component of soft magnetic material also coaxially surrounding said axis and situated within and surrounded by said coil means while being located closely adjacent thereto, said cylindrical component being connected at one end to an inner transverse wall of soft magnetic material extending along and engaging said transverse wall of said casing and at an opposite end to an outwardly directed flange projecting outwardly from said cylindrical stator component and having an outer peripheral edge fixed to an inner surface of said cylindrical wall of said casing with said coil means being situated between said flange and said transverse wall of said casing, said flange also being made of a soft magnetic material, so that said coil means, casing, cylindrical stator component, transverse wall fixed to said one end thereof and flange fixed to said other end thereof cooperate to form said AC magnetic circuit assembly which has no gap, and a rotor including an annular permanent magnet means coaxially surrounding said axis and situated coaxially within said cylindrical stator component while defining a small gap therewith, and support means connected with said permanent magnet means to support the latter for rotation about said axis, said cylindrical stator component being formed with a series of axially extending cutouts circumferentially distributed uniformly about said axis and being of a substantially elliptical configuration except for opposed ends of said cutouts, so that the latter define between themselves axially extending wall portions of said cylindrical stator component which are substantially of an hourglass configuration and have central regions where their circumferential width is smaller than at any other regions thereof.

4,009,407

SEGMENTED ELECTRODE TYPE GAS DISCHARGE DISPLAY PANEL WITH MERCURY GIVER MEANS

George A. Kupsky, State College, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

Filed July 30, 1974, Ser. No. 492,992
Int. Cl.² H01J *61/24, 61/30, 61/66*
U.S. Cl. 313—177 1 Claim



1. In combination with a gas discharge information display panel device having a sealed envelope constituted by a pair of insulating plates, one of said insulating plates having a viewing window for viewing the information displayed in the panel, a gas in said envelope and electrodes carried on the surfaces of said pair of insulating plates for selectively activating said gas, a laser energy activatable mercury giver means, said giver means being a non-metallic mercury carrier which is physically positioned between said plates, a pair of spaced laser energy transparent windows in said plates of said sealed envelope, said laser energy activatable giver means being physically located between said pair of laser energy transparent windows, and dielectric means retaining said giver means in position between said pair of spaced insulating plates and spaced from said electrodes, said panel having a discharge gap of about twenty thousandths of an inch,

said giver means being constituted by a filamentary hollow glass tube element consisting of a laser energy transparent glass having an outside diameter under about twenty thousandths of an inch and of a selected length,

said filamentary tube element being sealed at both ends and filled with elemental mercury, the length of said tube and the internal cross-sectional area of a hollow portion thereof being selected to contain a predetermined quantity of said mercury in a liquid state.

4,009,408

HIGH-PRESSURE SODIUM-VAPOR DISCHARGE LAMP

Nhiep Nguyen Dat, Chatenay Malabry; Maurice Bensoussan, Sevres, and Bernard Doucet, Colombes, all of France, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,715
Claims priority, application France, Dec. 16, 1974, 74.41317
Int. Cl.² H01J *61/00*
U.S. Cl. 313—198 4 Claims

1. An improved high-pressure sodium-vapor discharge lamp of the type having a pair of discharge electrodes defining a first discharge space within a refractory discharge envelope, and an auxiliary electrode defining a second discharge space relative to the discharge electrodes, wherein the improvement comprises:

forming the auxiliary electrode from a refractory metal spiral wound on an insulating rod supported within the lamp envelope having an electrical resistance value between 10 ohms and 10,000 ohms whereby the lamp starts between said auxiliary electrode and one of said discharge electrodes when the lamp is cold, and operates between the discharge electrodes when the lamp is hot.

4. A method for manufacturing an improved high-pressure sodium-vapor discharge lamp of the type having an auxiliary electrode in combination with two discharge electrodes within a lamp envelope including the steps of:

providing a refractory metal spiral on an insulating rod, said spiral having a resistance value from 500 –700 ohms;

mounting said insulated rod within said discharge envelope, said resistive spiral proximate one of said discharge electrodes for providing lamp starting therebetween said electrodes when the lamp is cold;

filling said lamp with a sodium compound and an inert gas; and

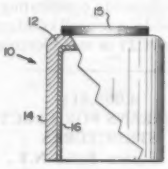
sealing said lamp to atmosphere.

4,009,409

FAST WARMUP CATHODE AND METHOD OF MAKING SAME

William E. Buescher, Seneca Falls, and Donald R. Kerstetter, Emporium, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 2, 1975, Ser. No. 609,447
Int. Cl.² H01J *1/20, 19/14*
U.S. Cl. 313—337 6 Claims



1. An indirectly heated cathode for an electron discharge device comprising: a formed substrate of a material selected from the group of nickel and cathode nickel alloys, said formed substrate having an outer surface and an inner surface, at least an area of said outer surface being formed to receive an electron emissive material; and a coating of vacuum deposited magnesium on said inner surface, said vacuum deposited magnesium having a darker color than said outer surface after firing at a temperature above the melting point of said vacuum deposited metal.

4,009,410

CATHODE-RAY TUBES ELECTRON-GUNS

Claude Pommier, and Andre Albertin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sept. 20, 1973, Ser. No. 399,095
Claims priority, application France, Sept. 26, 1972, 72.34000
Int. Cl.² H01J *29/50*
U.S. Cl. 313—411 4 Claims

1. An electron-gun for cathode ray tubes, comprising:

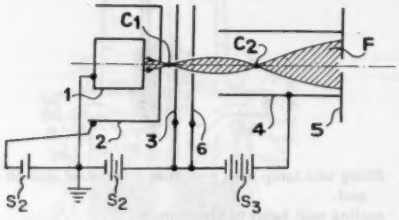
a cathode for emitting an electron-beam;

an apertured modulating electrode; means for connection to a biasing source for biasing said modulating electrode

negatively relative to said cathode; said modulating electrode controlling the intensity of said electron-beam;

accelerator means comprising an apertured accelerator grid and at least one cylindrical anode; the central aperture of said accelerator grid having substantially the same dimensions as the central aperture of said modulating electrode; said cylindrical anode being terminated at its end opposite to said cathode in a diaphragm which is maintained at the same potential as said anode:

means for connecting said accelerator grid and said at least one cylindrical anode to a biasing source for positively biasing said grid and anode relative to said cathode, and with said cylindrical anode being more positive than said accelerator grid;



said modulating electrode constituting with said accelerator grid a first condenser lens producing a first cross-over (C1) in said electron-beam and

at least one supplementary electrode of the diaphragm type, arranged between said accelerator grid and said anode, the central aperture of said supplementary electrode having dimensions slightly greater than those of the central aperture of said modulating electrode, and said supplementary electrode being connected to connecting means for biasing said electrode at a potential positive relative to said cathode and lower than that of said anode;

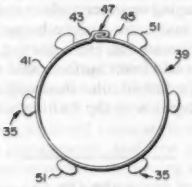
said supplementary electrode constituting with the adjacent opening in said anode, a second condenser lens forming a second cross-over (C2) in said electron beam.

4,009,411

ALIGNMENT MEANS FOR ELECTRON GUN STRUCTURES

Peter George Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 20, 1976, Ser. No. 659,706
Int. Cl.² H01J *29/02, 29/82*
U.S. Cl. 313—456 **5 Claims**



1. Means for aligning an electron gun assembly within a cathode ray tube having a longitudinal axes, said alignment means being formed for attachment to said gun assembly having a terminal electrode element including a substantially cylindrical sidewall portion oriented within the substantially cylindrical neck region of said tube, said electron gun alignment means comprising:

a one-piece band-like metallic base member having opposing ends discretely joined in an adjustable loose, lock seam jointure to form a closed and substantially circular unit having limited end related movement and an internal circumferential dimension slightly greater than the related external dimensioning of said electrode to facilitate the telescopic placement and circumferential matching of said circular base member upon said terminal electrode and expedite bonding of said base member to the sidewall of said electrode at a plurality of spatially related points therearound thereby effecting circumferential adjustment and attachment of said encompassing base member thereupon; and

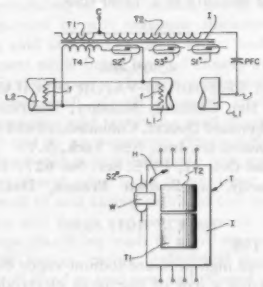
a plurality of spaced apart arm-like spacer contact projections extending from said band-like member in a manner substantially normal thereto to form a crown-like unit, each of said projections having a shank element contiguous to said base member and an opposed integral terminal portion, said terminal portions being configurated to provide substantially non-abrasive contact with the surface of said neck, said contact projections being collectively related in a spaced apart manner and substantially parallelly related to the longitudinal axis of the tube whereof said terminal portions conjunctively define a crown-like array having an external circumferential dimension greater than that of said base member and interior of said neck to effect tensioned placement of the array of said terminal portions against the encompassing neck region to thereby provide alignment of said gun assembly therein.

4,009,412

FLUORESCENT LAMP BALLAST CIRCUIT WITH MAGNETIC SWITCH

Frank M. Latassa, Magnolia, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 11, 1975, Ser. No. 640,023
Int. Cl.² H05B *41/23*
U.S. Cl. 315—106 **6 Claims**



1. A rapid start ballast circuit for a fluorescent lamp comprising:

primary lamp terminals for carrying lamp current,

secondary lamp terminals for supplying heating current to the lamp filaments,

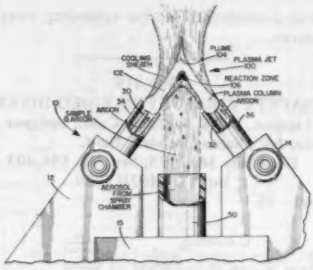
a transformer including a primary winding for alternating line current, a secondary winding with connection for supplying lamp current to the primary lamp terminals, and a tertiary winding in a circuit to the secondary lamp terminals, and

magnetic field sensing means responsive to the magnetic field of lamp current in the secondary winding and connection, including switching means in the tertiary winding circuit for opening the tertiary circuit after the lamp starts and draws operating current from the secondary winding.

4,009,413
PLASMA JET DEVICE AND METHOD OF OPERATING SAME

William G. Elliott, Lincoln, and Thomas J. Karlinski, Brookline, both of Mass., assignors to SpectraMetrics, Incorporated, Andover, Mass.

Filed Feb. 27, 1975, Ser. No. 553,572
Int. Cl.² G01J 3/30; H05H 1/00
U.S. Cl. 315—111.2 18 Claims

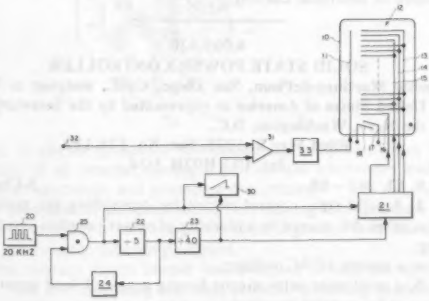


1. A plasma jet device which comprises in combination:
a. an anode electrode;
b. a cathode electrode;
c. the anode and cathode electrodes spaced apart and positioned such that their axes, if extended, would intersect at an angle;
d. first and second coaxial sleeve elements surrounding the anode and cathode electrodes, respectively;
e. means to flow an ionizable gas through the first and second sleeve elements and about the electrodes to form in operation a plasma jet comprising a continuous column of ionized gas between the anode and cathode electrodes, the plasma jet characterized by an inverted V-form shape and a reaction zone in the plasma jet at the lower region of the intersection of the extended axes of the electrodes; and
f. external and separate means to introduce a sample material directly into the reaction zone of the plasma jet.

4,009,414
BAR DISPLAY WITH SCALE MARKERS

Charles Paul Bockett-Pugh, Bracknell, England, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1975, Ser. No. 634,761
Claims priority, application United Kingdom, Nov. 27, 1974, 51325/74
Int. Cl.² H05B 37/00
U.S. Cl. 315—169 R 4 Claims

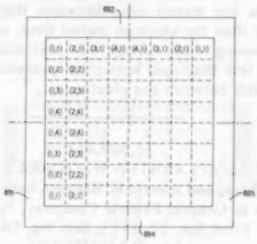


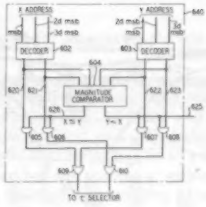
1. A bar display system comprising:
a bar display device having a multiplicity of electrodes arranged in a column and connected in at least three interdigitated sets;
a clock signal generator;
a display drive circuit driven by the clock signal generator for energizing each set of electrodes in sequence;
a ramp signal generator operated in synchronism with the energization of the bar display device;
a comparator for comparing an input signal with the ramp generated by the ramp signal generator;
display control means for changing the energization of the display when the output of the comparator changes; and
scale marker means comprising a divide-by-n circuit which is driven by the clock signal generator and the pulses from which modify the energization of the display.

4,009,415
PLASMA PANEL WITH DYNAMIC KEEP-ALIVE OPERATION UTILIZING A LAGGING SUSTAIN SIGNAL

Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1975, Ser. No. 634,373
Int. Cl.² H05B 41/14
U.S. Cl. 315—169 TV 10 Claims





1. A display system comprising
a plurality of display sites, each capable of existing in at least two states,
circuit means for applying addressing signals to selected ones of said sites,
at least one selectable external priming source disposed in an operative relation to said display sites for enhancing the effect of said addressing signals on said selected sites, and
circuit means for selectively initiating the activation of at least said one priming source during a designated intermediate portion of an individual one of said addressing signals, said designated intermediate portion being determined by th position of a selected display site relative to the position of at least said one priming source.

4,009,416
METHOD FOR OPERATING A GASEOUS DISCHARGE LAMP WITH IMPROVED EFFICIENCY

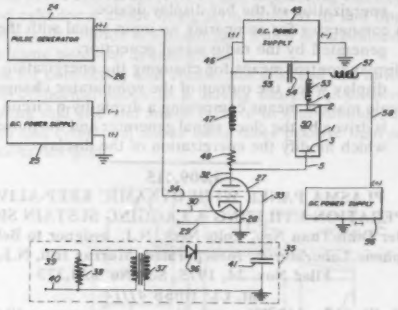
Frank Eugene Lowther, Severna Park, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed July 10, 1975, Ser. No. 594,790
Int. Cl.² H05B 41/16, 41/30
U.S. Cl. 315—176 8 Claims

1. In a method for producing light from a gas filled tube

wherein electrical energy is applied to the electrodes of said tube at a potential in excess of the ionization potential, the improvement which comprises:

a. dissipating pulsed electrical energy between the electrodes of said tube, wherein the pulses have a potential in



excess of the ionization potential, a duration of less than the gas ion transit time between the electrodes, and greater than the electron transit time; and

b. maintaining a low voltage bias potential across the electrodes less than said ionization potential to remove gas ions from between the electrodes.

4,009,417

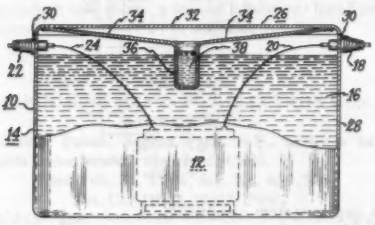
ELECTRICAL APPARATUS WITH HEAT PIPE COOLING

Paul L. Waldon, and Ronald E. Bennett, both of Hickory, N.C., assignors to General Electric Company, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,037

Int. Cl.² H02H *7/04*

U.S. Cl. 361—38 **4 Claims**



1. An electrical apparatus including an enclosure with a heat generating unit mounted therein and immersed in a dielectric fluid, a portion of said enclosure being hollow and forming a heat pipe, said hollow portion of said enclosure including an evaporator section which extends into said fluid dielectric and a condenser section forming an exterior wall of said enclosure, said hollow portion containing a working fluid.

4,009,418

ATTACHMENT OF HEAT PIPES TO ELECTRICAL APPARATUS

Ronald E. Bennett, Conover, N.C., assignor to General Electric Company

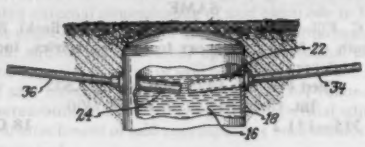
Filed Mar. 20, 1975, Ser. No. 560,127

Int. Cl.² H02H *7/04*

U.S. Cl. 361—38 **4 Claims**

1. An electrical apparatus including an enclosure with a heat generating unit mounted therein and immersed in a dielectric fluid;

at least one attachment well secured to said enclosure, a heat pipe mounted in said attachment well the evaporator section of said heat pipe extending into said attachment



well and a condenser section extending away from said enclosure.

4,009,419

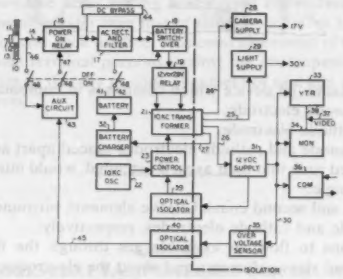
SAFETY CIRCUIT FOR VIDEO DIVER

James R. Ligman, Santa Barbara, Calif., assignor to General Aquadyne, Inc., Santa Barbara, Calif.

Filed July 16, 1975, Ser. No. 596,403

Int. Cl.² H02H *7/20*

U.S. Cl. 361—91 **6 Claims**



1. A video circuit for divers that protects the diver from shipboard electrical malfunctions comprising:

a. a video camera carried by the diver;

b. a shipboard video monitor electrically connected to the video camera for displaying video signals;

c. a shipboard source of electrical current;

d. a shipboard power supply transformer having a primary connected to said source and having a secondary connected to said video camera and said video monitor to supply power thereto;

e. means for varying the amount of current flow to the transformer primary;

f. and an optical feedback connection from the transformer secondary to the means for varying the current flow to the primary to thereby regulate the secondary output;

whereby the diver's video camera is electrically isolated from the shipboard source of electrical current, thereby protecting the diver from accidental high voltages or currents at the source of electrical current.

4,009,420

SOLID STATE POWER CONTROLLER

Emilio Martinez-dePison, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1975, Ser. No. 574,129

Int. Cl.² H02H *3/24*

U.S. Cl. 361—88 **5 Claims**

1. A solid state control circuit for controlling the application of an AC source to a plurality of power supplies comprising:

a. a source of AC voltage;

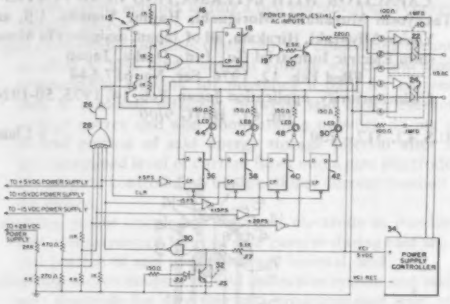
b. a solid state relay means having a pair of load terminals and a control terminal;

c. a plurality of load circuits connected in circuit with said load terminals to said AC source;

d. bistable flip-flop circuit means for providing first and second output signals;

e. first circuit means coupled to said bistable flip-flop circuit means and being responsive to said first output signal for generating a control signal for causing said relay to conduct and provide AC current to said loads;

f. said first circuit means being responsive to said second output signal for turning off said relay;



g. second circuit means coupled between each of said plurality of load circuits and said bistable flip-flop circuit means for providing an output pulse in response to a power supply failure in any one of said load circuits to cause said bistable flip-flop circuit to generate said second output signal.

4,009,421

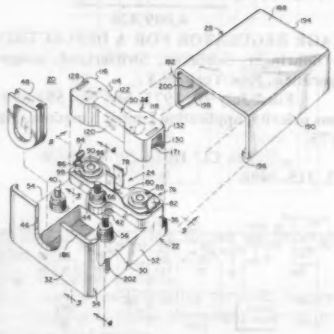
STATION PROTECTOR WITH A THREE-ELECTRODE GAS TUBE ARRESTER

Frank G. Splitt, Arlington Heights, and Eric A. Scheithauer, Chicago, both of Ill., assignors to Cook Electric Company, Morton Grove, Ill.

Continuation of Ser. No. 516,286, Oct. 21, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,798

Int. Cl.² H02H *3/22*

U.S. Cl. 361—119 **26 Claims**



1. A circuit protector for protecting telephone lines by means of an arrester having a pair of line electrodes and a ground electrode, and protector comprising

a substantially nonconductive base having line terminals to be coupled to said telephone lines, a ground terminal and an arrester mounting section,

line contact means in said base coupled to said line terminals and extending into said arrester mounting section,

grounding means in said base coupled to said ground terminal and extending into said arrester mounting section,

a ground clip assembly disposed in said arrester mounting section, said ground clip assembly having arrester holding means coupled to said grounding means and contact assembly means which has movable contact means coupled to said line contact means and selectively movable to be coupled to said grounding means, and

an arrester module having a case into which is insertable said arrester and having arrester contact means fusibly linked to said line electrodes, said case being retained in said arrester mounting section such that said ground electrode is coupled to said grounding means by said arrester holding means and said arrester contact means is coupled to and controls the movement of said movable contact means.

4,009,422

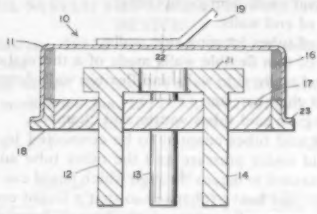
LIGHTNING ARRESTER CONSTRUCTION

Ernest L. Woodfill, Minneapolis, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed July 21, 1975, Ser. No. 597,594

Int. Cl.² H02H *3/22*

U.S. Cl. 361—120 **1 Claim**



1. A lightning arrester for preventing electrical surges comprising:

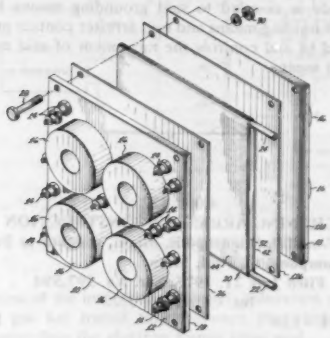
a cylindrical conducting cup-shaped housing having a flat surface and a side wall extending from said flat surface, said side wall having an edge, said side wall further having an inner and outer surface, said cylindrical housing having an external lead for connecting to an external ground; an insulating member for mounting within said edge of said side wall; a sealing ring extending around said cylindrical housing and said insulating member so that said cylindrical housing and said insulating member coact to thereby provide a hermetically sealed chamber in said cylindrical housing; an inert gas located in said hermetically sealed chamber and operable for ionization upon application of an electrical surge; a plurality of at least four electrodes each having a flat surface, said plurality of electrodes extending through said insulating layer so that said flat surface of each of said electrodes is located in the sealed chamber of said cylindrical housing, said flat surface and said plurality of electrodes located in a parallel equally spaced relationship from said flat surface of said cylindrical conducting housing; each of said electrodes' flat surfaces being identical to the other surfaces of said electrodes; each of said flat surfaces being circular in diameter, said electrodes and said surfaces spaced on a circle which is concentric with said cylindrical housing and each of said electrodes spaced equal distance from one another so that an electrical surge from any of said electrodes will be discharged to the electrical ground due to ionization of the gas in the hermetically sealed chamber; a fusible material extending around the inner surface of said side wall, said fusible material operable for melting if a continuous current is sustained between any one of said flat surface of said electrodes and said flat surface of said cylindrical housing.

4,009,423

LIQUID COOLED HEAT EXCHANGER FOR ELECTRONIC POWER SUPPLIES

Edward A. Wilson, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed July 2, 1975, Ser. No. 592,579
Int. Cl.² H01L 23/34
U.S. Cl. 361—385 6 Claims



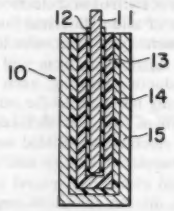
5. A heat exchanger comprising:
a pair of end walls;
a pair of tubes forming side walls;
a pair of thin flexible walls made of a thermal conductor;
said end walls, side walls and flexible walls forming a liquid tight chamber; and
openings in said tubes within said chamber,
one of said tubes adapted to be connected to a source of liquid under pressure and the other tube adapted to be connected to means through which liquid can be removed from said heat exchanger so that a liquid coolant under pressure can flow through the heat exchanger, said openings in said tubes being located so that the stream lines of fluid flowing between said tubes will have a predetermined pattern.

4,009,424

ELECTROLYTIC CAPACITOR HAVING A CONDUCTIVE GRAPHITE PARTICLES LAYER BETWEEN ORGANIC SOLID ELECTROLYTE AND CATHODE

Yoshimasa Itoh, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 26, 1975, Ser. No. 562,110
Claims priority, application Japan, Mar. 26, 1974, 49-34298
Int. Cl.² H01G 9/00; B01J 17/00
U.S. Cl. 361—433 5 Claims



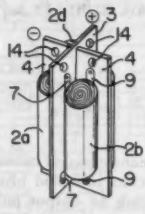
1. In an electrolytic capacitor having an anode of a valve metal covered with a dielectric film of an oxide of the valve metal, a solid electrolyte layer formed on the dielectric film, a cathode spaced from the anode and a conductive layer formed between and in intimate contact with the electrolyte layer and the cathode, the electrolyte layer being made of a semiconductive salt of 7,7,8,8-tetracyanoquinodimethane and a polymer and formed on and in intimate contact with the dielectric film, the improvement comprisng said conductive layer as a dispersion of finely powdered graphite in a thermoplastic resin amounting to from 1 to 10% by weight of said graphite, said graphite having a mean particle size ranging from 1 to 7 microns.

4,009,425

CAPACITOR WITH INTERSECTING LEAD PLATES

Takayoshi Muranaka, Moriguchi; Hajime Yoneda, Uji, and Yoshio Miyazaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 12, 1976, Ser. No. 657,644
Claims priority, application Japan, Feb. 14, 1975, 50-19248
Int. Cl.² H01G 9/00
U.S. Cl. 317—230 6 Claims



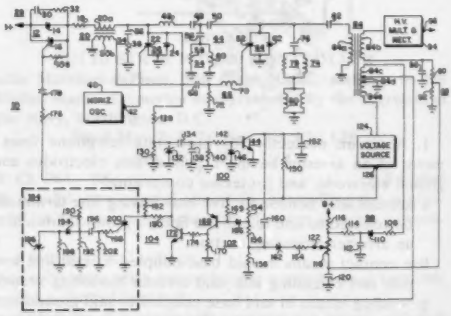
1. An electrolytic capacitor comprising a pair of lead plates made of conductive metal, one of said lead plates being formed with a slit extending from an intermediate portion to an upper end thereof while the other lead plate being formed with a slit extending from an intermediate portion to a lower end thereof, said pair of lead plates being assembled such that they intersect perpendicularly to each other and they are electrically isolated from each other, and a plurality of capacitor elements each comprising an anode foil and a cathode foil stacked on each other with a separator being interposed therebetween and the lamination being wound, the anodes and the cathodes of said capacitor elements being separately connected to said pair of lead plates, and an outer casing in which said capacitor elements are sealed with said capacitor elements being impregnated with electrolyte.

4,009,426

VOLTAGE REGULATOR FOR A DEFLECTION SYSTEM

Walter Böhringer, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed July 10, 1975, Ser. No. 594,899
Claims priority, application United Kingdom, May 16, 1975, 20868/75
Int. Cl.² H01J 29/70, 29/76
U.S. Cl. 315—408 12 Claims



1. A voltage regulator for a deflection system including a

commutating network for storing energy during an energy storage interval of each deflection cycle and for supplying said stored energy to a deflection winding and a high voltage transformer during a commutating interval of each deflection cycle, said voltage regulator comprising:

a direct current voltage source;

unidirectional current conducting means coupled to said direct current voltage source and said commutating network for providing a path for current flow in a first direction between said direct current voltage source and said commutating network during a first portion of said energy storage interval;

gate controllable, unidirectional current conducting means coupled to said direct current voltage source and said commutating network for providing a path for current flow in a second direction between said direct current voltage source and said commutating network during a second portion of said energy storage interval after a predetermined level of current flows into a gate electrode of said gate controllable, unidirectional current conducting means;

enabling means coupled to said gate electrode to provide said predetermined level of gate current during said second portion of said energy storage interval; and

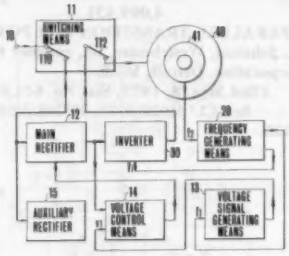
disabling means coupled to said deflection system and said gate electrode for diverting said predetermined level of gate current away from said gate electrode for an interval determined by the level of signals produced by said high voltage transformer thereby maintaining a substantially constant level of signals produced by said high voltage transformer from one deflection cycle to another.

4,009,427

ADAPTIVE CONTROL SYSTEM FOR AN ALTERNATING-CURRENT MOTOR

Shuichi Takahashi, 1-16, Takaido-higashi 1-chome, Suminami, Tokyo, Japan

Filed Jan. 22, 1975, Ser. No. 543,026
Claims priority, application Japan, Feb. 25, 1974, 49-21403
Int. Cl.² H02P 5/40
U.S. Cl. 318—227 **13 Claims**



1. An adaptive control system for an alternating-current motor comprising:

a poly-phase induction motor;

power supply means for generating variable frequency and variable voltage poly-phase alternating-current power to be supplied to said motor;

frequency control means for controlling said variable frequency of said power supply means;

voltage control means for controlling said variable voltage of said power supply means in relation to said variable frequency;

means for detecting the instantaneous velocity of said motor;

detector means for detecting the position error of said motor in relation to a commanded position and generating a desired slip frequency signal which is proportional to said position error;

slip frequency limiter means for generating a slip frequency signal by limiting the magnitude of said desired slip frequency signal within the magnitude of the slip frequency at which the maximum torque of said motor is developed;

means for generating a frequency signal by algebraically adding said slip frequency signal to said detected instantaneous velocity of said motor, the value of said velocity being represented by revolutions per second multiplied by the number of pole-pairs of said motor;

frequency generating means for generating a pulse frequency determined by said frequency signal, said pulse frequency controlling said frequency control means, and said frequency generating means comprising a register means for storing a digital code representative of said frequency signal, an accumulator means for storing the integrated value of said frequency signal and delivering overflow pulses, digital adder logic circuits for periodically adding the contents of said register means to the contents of said accumulator means, and pulse counter means for dividing the frequency of said overflow pulses to generate said pulse frequency; and

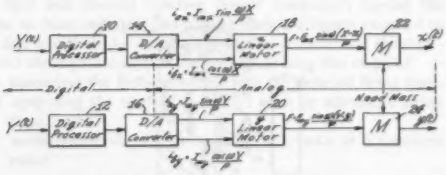
voltage signal generating means for generating a voltage signal in relation to said frequency signal as the reference signal for said voltage control means.

4,009,428

CONTROL SYSTEM FOR MAGNETIC POSITIONING DEVICE

Bruce A. Sawyer, 20120 Allentown Drive, Woodland Hills, Calif. 91364

Continuation of Ser. No. 36,177, May 11, 1970, abandoned.
This application Jan. 15, 1973, Ser. No. 323,387
Int. Cl.² G05B 19/40
U.S. Cl. 318—571 **25 Claims**



1. In a system for providing a controlled relative movement between two members along a particular axis, the combination of:

a first member,

a second member disposed relative to the first member for displacement relative to the first member along the particular axis,

first means for providing signals representing any desired displacements of the first member relative to the second member to any desired position along the particular axis,

second means for providing signals having sinusoidal characteristics and having a particular phase displacement relative to each other,

third means responsive to the signals from the first means and the signals from the second means for providing indications representing the positions at which the signals from the second means are to be shifted through a controllable angle, during the displacements of the first member relative to the second member along the particular axis, in accordance with the desired displacement represented by the first signals,

fourth means responsive to the signals from the third means for instantaneously shifting the phase of the signals from the second means through the controllable and variable angles at the particular positions in accordance with the characteristics of the signals from the third means and for maintaining the phase shift of such signals through the controllable and variable angle for an extended distance after such particular positions to provide for controlled

variations in the magnitudes of accelerations and decelerations between the first and second members along the particular axis in accordance with the shifts in the phase of the polyphase recurrent analog signals through the controllable angles,

fifth means for varying the frequency of the signals from the second means, and

sixth means operatively coupled to a particular one of the first and second members and interacting with the other one of the first and second members and disposed in phase-displaced relationship in accordance with the phase displacement of the signals from the second means and responsive to the phase-shifted signals provided by the fourth means for imposing controlled magnitudes of acceleration and deceleration between the first and second members along the particular axis to produce continuous displacements between the first and second members along the particular axis to the desired position,

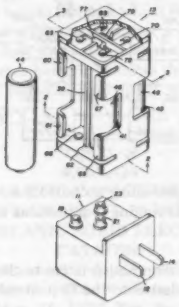
the first and second members being constructed to provide a movement of the second member relative to the first member in synchronism with the recurrent characteristics of the signals from the fourth means.

4,009,429

CHARGER WITH MULTIPLE ATTACHABLE CELLHOLDER MODULES

Ferdinand H. Mullersman, Gainesville, Fla., assignor to General Electric Company, Columbus, Ohio

Filed Dec. 31, 1975, Ser. No. 645,843
Int. Cl.² H02J *7/00*
U.S. Cl. 320—2 **12 Claims**



1. A charging system comprising:

a. a source of charge current comprising (1) a housing, (2) a transformer having a secondary winding disposed in said housing, and (3) first, second and third source terminals, said first and third source terminals connected to said winding, said second source terminal connected to said winding at a point intermediate of the connections of said first and third source terminals to said winding;

b. a first cellholder module comprising (1) first, second and third module terminals for selective connection to said first, second and third source terminals, respectively; (2) compartment means for holding a plurality of cells for charging; (3) circuit means connecting at least one cell in series between said first and second module terminals and between said second and third module terminals, respective; and

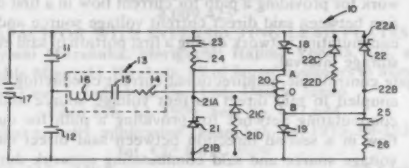
c. a second module comprising (1) compartment means for holding at least one cell of a physical size different from said compartment means of said first module and (2) having only first and second module terminals for connection, respectively, to said first and third source terminals.

4,009,430

ANTIPARALLEL COMMUTATED INVERTER

Donald F. Partridge, 436 Aldo Ave., Santa Clara, Calif. 95050

Filed Apr. 14, 1975, Ser. No. 568,040
Int. Cl.² H02M *7/515*
U.S. Cl. 321—45 C **21 Claims**



1. A control system for regulating power input to a resonant electrical load from a dc source having first and second terminals, the combination comprising:

a magnetic means connected between said first and second terminals to receive power from said source;

a first switching device between the magnetic means and said first terminal and a second switching device between said magnetic means and said second terminal operable to commutate the flow of power from the respective terminal to the magnetic means when the switching device is interrupted;

a first anti-parallel means connected across said first switching device and a second anti-parallel means connected across said second switching device; and

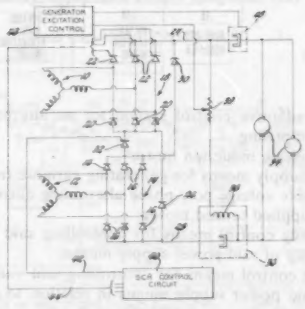
a series resonant load connected with said magnetic means to receive power through the magnetic means from said dc source whereby by the selective commutation of said switching devices the power input to the load from the source can be regulated while said first and second anti-parallel means serve to provide a path for reverse current from the load around the respective switching device as the associated switching device is commutated.

4,009,431

SERIES PARALLEL TRANSITION FOR POWER SUPPLY

Lauren L. Johnson, Westchester, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1975, Ser. No. 611,073
Int. Cl.² H02P *9/00;* **H02M** *7/04*
U.S. Cl. 322—7 **3 Claims**



1. In a system for transmitting electrical power from an AC generator having two similar output sections to a load, a generator transition circuit for smoothly changing the generator output between a high current, low voltage mode and a low current, high voltage mode comprising

first and second rectifier means connected respectively to

said output sections to provide DC power from each section,

first and second conductors connected to the load,

switch means for connecting the rectifier means in series between the first and second conductors to provide a high voltage, low current mode when the switch means is conductive,

means for connecting the rectifier means in parallel to provide a low voltage high current mode including a pair of circuit paths, each circuit path including a diode allowing conduction only when the said switch means is nonconductive for connecting each rectifier means respectively between the first and second conductors,

voltage modulating controlled rectifier means in said first rectifier means for controllably varying the output voltage of the first rectifier means,

transition signal means for initiating a desired transition from one mode to another,

means responsive to the transition signal means for gating the voltage modulating controlled rectifier means to reduce the output voltage of the said first rectifier means to substantially zero, operating the switch means when the output voltage is so reduced and, after the switch means is operated, gating the modulating controlled rectifier means to increase the output voltage of the said first rectifier means, the voltage of the said first rectifier means being changed gradually when the output sections are connected in series,

and generator excitation control means for controlling the output voltage of said second rectifier means such that the combined output voltage of said first and second rectifier means is held substantially constant while the output voltage of said first rectifier means is being varied and the said rectifier means are connected in series.

4,009,432

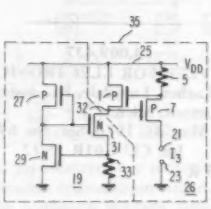
CONSTANT CURRENT SUPPLY

Andrew Gordon Francis Dingwall, Somerset, and Bruce David Rosenthal, Randolph, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,181

Int. Cl.² G05F *1/56*

U.S. Cl. 323—4 **17 Claims**



13. A current supply comprising, in combination:

first and second terminals between which an operating voltage may be applied;

first and second transistors of one conductivity type and a third transistor of opposite conductivity type, each having a conduction path and a control electrode;

first and second resistors;

two terminals for a load, one connected to said second terminal;

a first series circuit connected between said first terminal and the other terminal for said load, comprising said first resistor and the conduction path of said first transistor, in that order;

a second series circuit connected between said first and second terminals comprising the conduction path of said second transistor, the conduction path of said third transistor and said second resistor, in that order;

a direct connection from the control electrode of said second transistor to the connection between the conduction path of said first transistor and said first resistor;

a direct connection from the control electrode of the first transistor to the connection between the conduction paths of the second and third transistors; and

means coupled to the control electrode of said third transistor for applying a voltage thereto for regulating the flow of current through its conduction path.

4,009,433

METHOD AND APPARATUS FOR COMPENSATING REACTIVE POWER

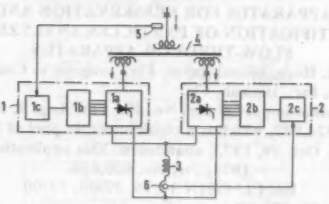
Gottfried Moltgen, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 12, 1975, Ser. No. 630,948

Claims priority, application Germany, Nov. 18, 1974, 2454651

Int. Cl.² H02J *3/18*; G05F *1/68*

U.S. Cl. 323—102 **5 Claims**



3. A method of operating apparatus for compensating the reactive power in a three phase network, the apparatus including first and second reactive power converters having the same no load voltages and having their a-c inputs coupled to the line and their d-c outputs coupled in parallel and short-circuited through a common choke comprising the steps of:

a. operating the first converter with the delayed firing time;

b. operating the second converter with an advanced firing time; and

c. maintaining the d-c current in the choke at a constant value.

4,009,434

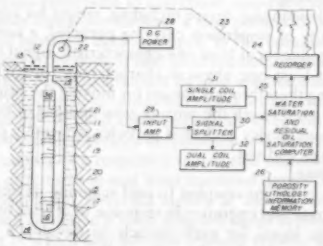
DIELECTRIC INDUCTION LOGGING SYSTEM FOR OBTAINING WATER AND RESIDUAL OIL SATURATION OF EARTH FORMATIONS

Philip F. McKinlay, and Richard A. Meador, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,798

Int. Cl.² G01V *3/10*, *3/18*

U.S. Cl. 324—6 **17 Claims**



1. A method for determining the characteristics of earth formations in the vicinity of a well borehole comprising the steps of:

generating, in a well borehole, a radio frequency electromagnetic field in the frequency range from **10** to **60** megahertz;

detecting, at a first spaced distance in the borehole, the total field amplitude of the electromagnetic field at said generated frequency this amplitude being influenced by earth formation materials at a first effective depth of investigation;

detecting, at a second spaced distance in the borehole, the total field amplitude at said generated frequency this amplitude being influenced by earth formation materials at a second, different, effective depth of investigation; and

combining said total field amplitude measurements having different effective depths of investigation according to a predetermined relationship to derive an indication of the earth formation conductivity and permittivity at said generated frequency.

4,009,435

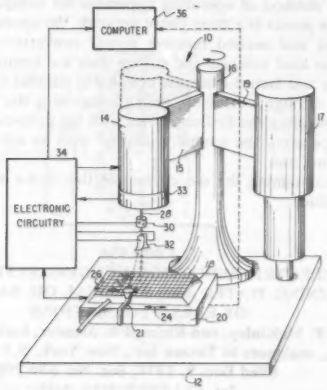
APPARATUS FOR PRESERVATION AND IDENTIFICATION OF PARTICLES ANALYZED BY FLOW-THROUGH APPARATUS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 496,178, Aug. 9, 1974, Pat. No. 3,924,947, which is a continuation-in-part of Ser. No. 407,811, Oct. 19, 1973, abandoned. This application Oct. 8, 1975, Ser. No. 620,658

Int. Cl.² G01N *33/16, 27/00, 51/00*

U.S. Cl. 324—71 CP **30 Claims**



1. An apparatus for identifying particles in a liquid suspension comprising:

a particle scanning device including, means for containing a quantity of suspension carrying particles, a sensing zone for producing at least one characteristic signal representing at least one physical characteristic of each particle passing therethrough, means for moving the suspension in a stream through the sensing zone and out of the particle scanning device such that particles separately pass therethrough and out,

a substrate;

sequencer means coupled to said scanning device and said substrate and operative in response to at least one characteristic signal for each particle to develop a particular sequence signal and to direct the stream and particle therein producing said characteristic signal to a particular location on said substrate corresponding to said particular sequence signal and;

memory means coupled to said sensing means and said sequencer means and operative in response to said at least one characteristic signal to store said characteristic signal and one of said sequence signals and a memory location identifier corresponding to said substrate location, whereby each particle location and characteristic can be correlated.

4,009,436

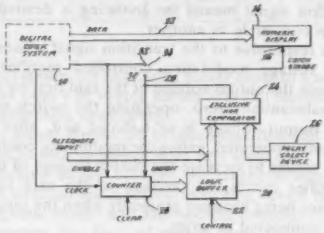
LATCH STROBE GENERATOR CIRCUIT

Daniel F. Dlugos, Huntingdon, and Flavio M. Manduley, Seymour, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 15, 1975, Ser. No. 640,488

Int. Cl.² G01R *15/12;* **G11C** *11/02*

U.S. Cl. 324—73 R **8 Claims**



1. In a monitor having a data display means with a latch strobe input for freezing the display, said monitor being used for servicing digital logic systems which manipulate data in a time-controlled sequence, an improved latch strobe generator comprising:

a. means for generating a set of signals representing the current time in the time-controlled sequence,

b. an operator-controlled selection means for establishing a set of signals representing the time in the sequence at which the display is to be frozen, each said set of signals having a unique format representing a different time; and

c. a comparator circuit connected to said selection means and said signal generating means to generate the latch strobe when the compared sets of signals are complementary

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4,009,437

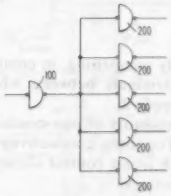
NET ANALYZER FOR ELECTRONIC CIRCUITS

William Arthur Lacher, Lansdale, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 31, 1976, Ser. No. 672,426

Int. Cl.² G01R *15/12*

U.S. Cl. 324—73 R **16 Claims**



1. A net analyzer for testing a plurality of circuit nets which include at least two types distinguishable from each other by their controlled impedances comprising:

circuit means coupling said analyzer to the nets to be tested,

current source means coupled to the net under test for causing a first current of predetermined amplitude to flow therethrough and to develop a first voltage thereacross,

net type selection means including comparison means for comparing said first voltage to a reference potential and

to generate an output signal which is indicative of the type of net under test,

current source means coupled to said net under test for causing a second current of predetermined amplitude to flow therethrough and to develop a second voltage thereacross,

net measurement means including a plurality of pairs of comparison means, each pair being associated with one of said net types, a pair of reference voltages coupled respectively to one of two input terminals of each of said pair of comparison means, said reference voltages for each of said pairs establishing a tolerance range for said second voltage,

circuit means for coupling said second voltage in common to the other input terminals of all of said comparison means,

gating means coupled to the outputs of each pair of said comparison means,

means responsive to said net type selection means output signal for tending to enable only that particular gating means coupled to a comparison means associated with the type of net under test,

the application to said last mentioned comparison means of a second voltage lying outside said tolerance range causing it to generate an output signal capable of enabling the gating means coupled thereto, an output from said gating means signifying the presence of an out-of-tolerance net.

4,009,438

SUPERHETERODYNE RECEIVER WITH A DIGITALLY ADJUSTABLE TUNING ARRANGEMENT

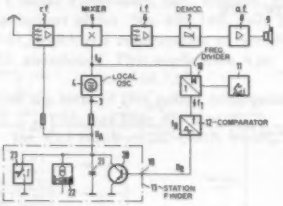
Lothar Grohmann, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,031

Claims priority, application Germany, July 3, 1973, 2333852

Int. Cl.² H04B 1/26

U.S. Cl. 325—421 **3 Claims**



1. An improved superheterodyne receiver wherein there is provided an information-transmission circuit, a local oscillator tunable with a dc voltage, a digitally adjustable tuning arrangement coupled to the output of said local oscillator and containing a frequency divider having a numerically adjustable division ratio, a device for digitally adjusting the frequency divider, and a frequency comparator having a dc voltage output which is dependent on the input frequency and approximates a fixed reference frequency, wherein the improvement comprises:

an automatic tuning control circuit within said tuning arrangement having an input coupled to the output of said frequency comparator and having an output which provides a tuning voltage coupled to the tuning input of said local oscillator, said automatic tuning circuit comprising:

a storage capacitor;

a constant current source;

a threshold switch; and

a controllable resistance coupled in parallel with said storage capacitor and formed by a transistor having base emitter and collector electrodes, said emitter electrode coupled to ground, said collector electrode coupled to said storage capacitor, and said constant current source, and said threshold switch, and said base electrode coupled to the output of said frequency comparator.

4,009,439

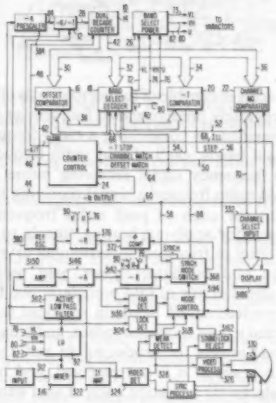
PROGRAMMING UNIT FOR A TELEVISION TUNING PHASE LOCKED LOOP

Robert Morgan Rast, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,097

Int. Cl.² H04B 1/16

U.S. Cl. 325—421 **13 Claims**



1. In a television tuning system for providing a plurality of local oscillator signals respectively corresponding to a plurality of channels a viewer may select, said plurality of said local oscillator signals being partitionable into a plurality of frequency bands in which there is predetermined frequency spacing between adjacent local oscillator signals, an apparatus for dividing the frequency of a local oscillator signal by a predetermined number corresponding to the selected channel to form an output signal, comprising:

counter means responsive to said local oscillator signal for counting periods of said local oscillator signal and for generating a count signal representing the number of periods counted;

channel selection means for generating a channel number signal representing the number of said selected channel;

first means responsive to said count signal and said channel number signal for forming a first portion of said output signal having a duration equal to the duration of a first number of periods of said local oscillator signal, said first number being determined by said selected channel;

means responsive to said count signal for generating one of a plurality of band traversed signals whenever said number of counted periods corresponds to a channel defining a boundary of a respective one of said plurality of bands;

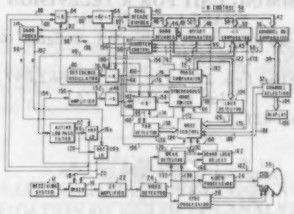
means responsive to said band traversed signals for examining said band traversed signals at the end of said first portion to derive a band selected signal representing the band in which said selected channel resides; and

second means responsive to said count signal and said band selected signal for forming a second portion of said output signal having a duration equal to the duration of a second number of periods of said local oscillator signal, said second number being determined by the band in which the selected channel resides.

4,009,440
RADIO RECEIVER

Hisao Okada, Neyagawa; Hideo Oyabe, Osaka, and Isao Akita, Sakai, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Aug. 27, 1975
Claims priority, application Japan, Sept. 6, 1974, 49-103305; Mar. 20, 1975, 50-35145
Int. Cl.² H04B 1/36
U.S. Cl. 325—335 16 Claims



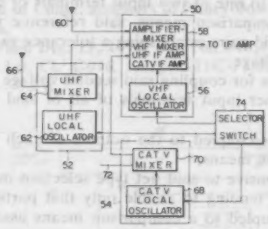
1. A radio receiver capable of tuning to signals of a plurality of channels of separately predetermined frequencies on a plurality of predetermined bands comprising a radio frequency section for each of said bands, each of said radio frequency sections having radio frequency signal receiving means and a mixer coupled to said radio frequency signal receiving means, a band control circuit for each of said radio frequency sections, oscillator means for applying beating signals to each of said mixers, a plurality of frequency-determining crystal means for connection to said oscillator means, said oscillator means producing a signal at one of said predetermined frequencies in one of said predetermined bands in response to each crystal being connected to said oscillator means, audio detection means coupled to said mixers for producing an audio signal when a radio frequency signal is being received, and band selecting means for selectively actuating each of said band control circuits of said radio frequency sections for each of said plurality of said bands, said audio detection means further including squelch means for the prevention of producing an audio signal when a radio frequency signal is not being received, automatic scanning means coupled to said band control circuits through said band selecting means and to said plurality of crystal means to sequentially connect the crystal means to said oscillator means and to sequentially actuate said band control circuits, and indication means coupled to said automatic scanning means and also to said band selecting means so that said indication means is controlled by an output of said automatic scanning means and said band selecting means so as to indicate both a particular channel and a particular band being received simultaneously, said indication means comprising a plurality of sets of indication elements corresponding to the number of channels to be received with each of said sets further including a plurality of indication elements of different colors corresponding to the number of bands to be received, said band control circuits including means for energizing the indication element of each set of said elements corresponding to the band in which the channel is being received.

4,009,441
MULTI-BAND TELEVISION TUNING APPARATUS

Tadashi Kumagai, Soma, and Shoji Ogasawara, Tokyo, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,735
Claims priority, application Japan, Mar. 30, 1974, 49-35844
Int. Cl.² H04B 1/16
U.S. Cl. 325—430 6 Claims

1. Multi-band television tuning apparatus comprising:
a combined amplifier-mixer which combines a VHF mixer, a UHF IF amplifier and a CATV IF amplifier,
a VHF local oscillator connected to said combined amplifier-mixer;
a UHF tuner having a UHF IF signal output connected to said combined amplifier-mixer;
a CATV tuner having a CATV IF signal output connected to said combined amplifier-mixer; and
band selector switch means connected to perform three

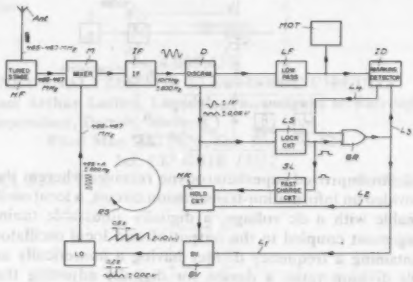


alternative switching functions, namely (1) enable the VHF local oscillator and disable the UHF tuner and CATV tuner to receive VHF; (2) enable the UHF tuner and disable the VHF local oscillator and CATV tuner to receive UHF; and (3) enable the CATV tuner and disable the VHF oscillator and UHF tuner to receive CATV;
said band selector switch means comprising a single selector switch.

4,009,442
DEVICE WHICH AMONG A NUMBER OF RADIO SIGNALS SELECTS ONE SPECIALLY MARKED RADIO SIGNAL

Knut Thorkel von Brömssen, Ryaavagen 100, S-191 47 Sollentuna, Sweden

Filed May 12, 1975, Ser. No. 576,816
Int. Cl.² H04B 1/32
U.S. Cl. 325—470 3 Claims



1. Apparatus for scanning within a radio frequency band and for selecting one radio signal from a possible number of radio signals which selected radio frequency signal includes a special marking, comprising:
a. first means for receiving a radio frequency signal;
b. local oscillator means;
c. a time-base circuit for controlling the local oscillator by an output scanning voltage for causing the local oscillator to vary its output frequency within a predetermined frequency band in accordance with the variations in said output scanning voltage;
d. a mixing stage connected to the outputs of said first means and to the local oscillator;
e. an intermediate-frequency amplifier connected to the output of the mixer stage, said intermediate-frequency amplifier delivering an amplified signal each time the

varying output frequency of the local oscillator corresponds to a received radio signal;

f. a discriminator, connected to the output of the intermediate-frequency amplifier, providing a control signal depending upon the amplified signal;

g. an identification circuit responsive to an output of said discriminator and activated during the sensing of radio signals for detecting said marking;

h. a locking circuit connected between the discriminator and said time-base circuit, said locking circuit responsive to said control signal during a predetermined short period for inhibiting the time-base circuit to thereby maintain its output scanning voltage essentially constant so as to stop scanning during said predetermined short period,

wherein the locking circuit includes a mono-stable circuit responsive to said control signal, the pulse-time of the mono-stable circuit defining said predetermined short period.

4,009,443

METHOD AND APPARATUS FOR PROVIDING PRIMARY COINCIDENCE CORRECTION DURING PARTICLE ANALYSIS UTILIZING TIME GENERATION TECHNIQUES

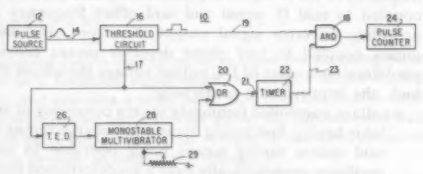
Wallace H. Coulter, Miami Springs; Walter R. Hogg, Miami Lakes; Millard D. Longman, Jr.; Stephen Campbell, both of Hialeah, and Edward Neal Doty, Pompano, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 485,160, July 2, 1974, Pat. No. 3,936,741, which is a continuation of Ser. No. 407,235, Oct. 17, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,722

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.² H03K *5/20;* **G01N** *27/00*

U.S. Cl. 328—111 **21 Claims**



1. A method for correcting a particle pulse count subject to coincidence error including the steps of:

counting the particle pulses received for a predetermined period of time,

increasing said predetermined period of time by a fixed time increment in response to each pulse, the fixed time increment being a function of coincidence error and therefore related to pulse width.

13. The apparatus of claim 12 wherein said control means is further operative to increase said predetermined time period by a second time increment in response to the termination of each detection signal, said second time increment having a duration which is a function of the repetition rate of said particle pulses.

4,009,444

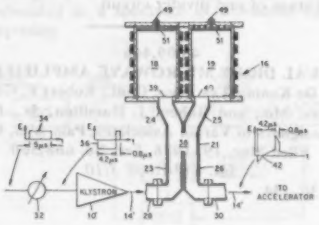
PASSIVE RADIO FREQUENCY PEAK POWER MULTIPLIER

Zoltan D. Farkas, Menlo Park, and Perry B. Wilson, Palo Alto, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 30, 1974, Ser. No. 501,911

Int. Cl.² G01S *7/28;* **H03K** *5/01;* **H05H** *7/02*

U.S. Cl. 328—233 **7 Claims**



1. A radio frequency peak power multiplier for multiplying the peak power of a radio frequency source for application to a load, comprising:

an input waveguide for receiving radio frequency input power;

an output waveguide for delivering radio frequency output power;

passive means coupled to said input waveguide for storing said input power, said means being operable upon cessation of the input power for delivering peak power to said output waveguide at a higher level than the input power to said input waveguide;

a radio frequency power source operable to emit voltage fields of first and second polarities, said power source being coupled to said input waveguide for storing power from said power source in said passive means; and

means for reversing the polarity of the voltage field from said power source for combination with the voltage fields from said passive means to produce peak power in said output waveguide that is at a higher level than the power from said power source.

4,009,445

DIVIDER FOR AN ELECTRONIC TIMEPIECE

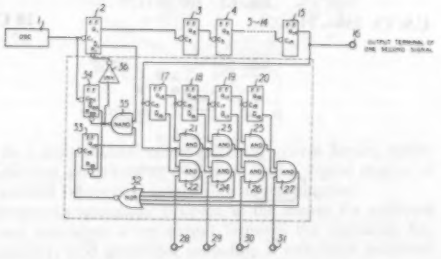
Ryozo Hasegawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 15, 1975, Ser. No. 605,062

Claims priority, application Japan, Aug. 19, 1974, 49-94805[U]

Int. Cl.² H03K *21/36*

U.S. Cl. 328—49 **2 Claims**



1. A divider for an electronic timepiece comprising in combination: a mulitstage divider circuit having a plurality of ½

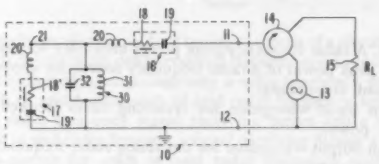
dividing circuit stages connected in series configuration to each other for receiving high frequency input signal pulses for counting and dividing them into lower frequency output signal pulses; means for changing the intermediate and final output pulse signals of said divider circuit to pulses which are not overlapped with each other; means for obtaining a preselected number of pulse signals which are smaller in number than the dividing number of said divider circuit against the final one output periodical term by adding said pulses; and means for selectively stopping the counting of only one input signal pulse to the first stage of said divider circuit.

4,009,446

DUAL DIODE MICROWAVE AMPLIFIER

Joseph G. De Koning, Los Altos, Calif.; Robert E. Goldwasser, St. Peters, Mo., and Robert J. Hamilton, Jr., Los Altos, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Mar. 19, 1976, Ser. No. 668,560
Int. Cl.² H03F *3/10*
U.S. Cl. 330—34 **16 Claims**



1. A microwave reflection amplifier adapted to operate over a selected frequency band comprising:

a pair of input-output terminals,

two negative-resistance elements connected in series across said terminals, each of said negative-resistance elements comprising a negative-resistance diode in series with a resonating inductor,

means for supplying dc bias to said diodes, and

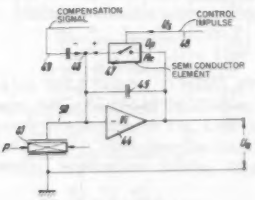
a shunt-resonant circuit connected in shunt across one of said negative-resistance elements, said shunt-resonant circuit being shunt-resonant at a frequency in the vicinity of said band.

4,009,447

AMPLIFIER ARRANGEMENT WITH ZEROING DEVICE FOR PIEZOELECTRIC TRANSDUCERS

Hans-Joachim Wolf, Freienstein; Franz Meier, Hettlingen, and Hans Ulrich Baumgartner, Winterthur, all of Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland

Filed July 20, 1973, Ser. No. 381,006
Claims priority, application Switzerland, July 28, 1972, 11465/72
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976
Int. Cl.² H03F *1/36*
U.S. Cl. 330—110 **20 Claims**



1. An amplifier measuring a circuit comprising:

a piezoelectric transducer for supplying output signals representative of an input quantity being measured;

an amplifier, having an input connected to said piezoelectric transducer, for providing an output representative of an operation effected on said output signals, said amplifier having an input impedance of at least 10^{10} ohm; and

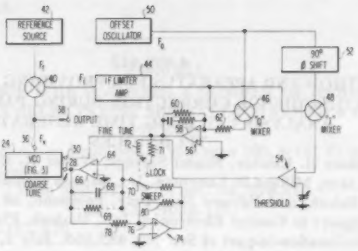
means, connected to the input of said amplifier, for resetting the input voltage to a prescribed value, said means including at least one semiconductor element which receives a remote-controllable signal for controlling the resetting of said input voltage, said amplifier input further including a compensation input to which error signals are applied, for compensating for zero jumps in said semiconductor element.

4,009,448

PHASE LOCK LOOP FOR A VOLTAGE CONTROLLED OSCILLATOR

Francis W. Hopwood, Severna Park, and Lester K. Staley, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1976, Ser. No. 646,800
Int. Cl.² H03B *3/04*
U.S. Cl. 331—4 **10 Claims**



1. In a phase locked loop servo system adapted to phase lock a voltage controlled oscillator to a reference frequency signal wherein the system includes, a reference frequency source and a voltage controlled frequency source coupled to a signal mixer providing an IF signal therefrom, an offset frequency source providing an output frequency equal to the frequency of the IF signal at phase lock, phase detector means coupled to said IF signal and said offset frequency source providing an error signal output therefrom, and amplifier means coupled to said phase detector means providing a predetermined value of DC output voltage therefrom at phase lock, the improvement comprising:

a voltage controlled frequency source consisting of an oscillator having fine tuning means and coarse tuning means, said coarse tuning means being operable to tune the oscillator monotonically over a predetermined frequency band;

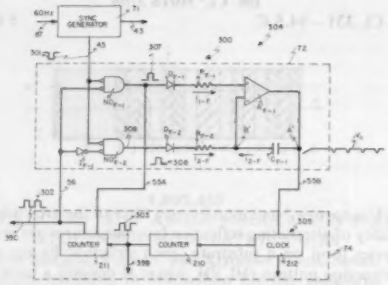
circuit means coupling the output of said amplifier means to said fine tuning means, said fine tuning means being responsive to said DC output voltage to fine tune the oscillator; and

integrator circuit means coupling the output of said amplifier means to said coarse tuning means and being responsive to a departure of said DC output voltage from said predetermined value to tune the frequency of said oscillator until said predetermined value of DC voltage is again applied to said fine tuning means, whereby the tuning sensitivity of the fine tuning means is substantially constant across said predetermined frequency band and the bandwidth of the phase lock loop remains substantially constant.

4,009,449
FREQUENCY LOCKED LOOP

David J. Agans, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 11, 1975, Ser. No. 640,106
Int. Cl.² H03B 3/04
U.S. Cl. 331—16 7 Claims



1. A frequency locked loop for use in a system wherein events are timed to occur on the basis of a periodic waveform whose frequency is f_0, comprising, in combination: sync generator means that produces a sampling pulse at the frequency f_0, counter means; voltage controlled clock means connected as clock input at a frequency f_1 to the counter means; control circuit means that generates a control voltage V_c to control the output frequency f_1 of the clock means; said counter means comprising a first counter and a second counter, the first counter being connected to divide the clock frequency by 2^m to produce an output frequency

$$f_2 = f_1/2^m,$$

the second counter being resettable and being connected to receive said output frequency f_2 as input and to provide as output a frequency which always equals the frequency f_0 and, when locked,

$$f_2 = f_2/(2^n + K),$$

wherein K is a circuit parameter and m and n are integers, the frequency f_1 being adjustable under the regulation of the control means to render the frequency f_2 locked to the frequency f_0 that serves as a standard for the electric system of which the frequency locked loop is a part in the relationship

$$f_2 = f_0\,(2^n + K);$$

and sampling means that receives as input the sampling pulse as well as a feedback signal from the output of the second counter and provides a reset pulse that is connected to reset the second counter and a further pulse, the further pulse and the reset pulse being connected as input to the control circuit means to provide as output the voltage V_c.

4,009,450
PHASE LOCKED LOOP TRACKING FILTER HAVING ENHANCED ATTENUATION OF UNWANTED SIGNALS

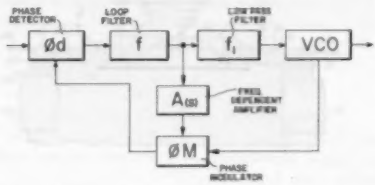
Don R. Holcomb, Phoenix, and Arthur J. Kline, Jr., Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 14, 1975, Ser. No. 568,073
Int. Cl.² H03B 3/04
U.S. Cl. 331—17 2 Claims

1. A tracking filter for tracking a signal of a certain characteristic embedded in a spectrum of unwanted signals and noise, comprising:

a phase locked loop having a phase detector, a loop filter and an oscillator configured for tracking the wanted signal and attenuating the unwanted signals and noise, and enhancing means including a low pass filter interposed between the loop filter and said oscillator, a phase modulator interposed between said oscillator and said phase detector and a frequency dependent amplifier interposed between the output of the loop filter and said phase modulator, wherein said low pass filter, said modulator and said amplifier are scaled to cancel the effect of each other out in the loop while providing the additional filtering action to the loop output.

2. A tracking filter for tracking a signal of a certain characteristic embedded in a spectrum of unwanted signals and noise, comprising:

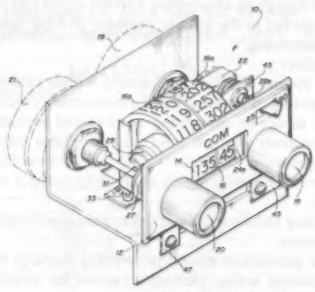


a phase locked loop having a phase detector, a loop filter and an oscillator configured for tracking the wanted signal and attenuating the unwanted signals and noise, and enhancing means including a low pass filter interposed between the loop filter and said oscillator, a phase modulator interposed between the oscillator and said phase detector and a frequency independent amplifier interposed between the output of said low pass filter and said phase modulator wherein, said low pass filter, said modulator and said amplifier are scaled to cancel the effect of each other out in the loop while providing the additional filtering action to the loop output.

4,009,451
FREQUENCY RANGE SELECTABLE OSCILLATOR FOR MULTICHANNEL COMMUNICATION SYSTEM

Edward B. Moore, North Caldwell, and Donald P. Ryan, Pine Brook, both of N.J., assignors to Edo-Aire, a Division of Edo Corporation, Fairfield, N.J.

Filed June 12, 1975, Ser. No. 586,227
Int. Cl.² H03B 5/36; H03J 1/02
U.S. Cl. 331—64 5 Claims



1. In a multichannel communication system having means for selecting an operating frequency and a digital display of the selected frequency, comprising in combination:

a frequency generator coupled to the means for selecting and providing at an output terminal the operating frequency, said generator including a reference oscillator comprising:

a crystal selected to oscillate at a desired base reference frequency,

capacitance means connected to said crystal in a circuit to oscillate therewith,

means for changing the capacitance of said means to pull the oscillations of said crystal from one frequency to an alternate frequency, and

an amplifier having an input connected to receive the oscillations of said crystal and generating a reference output frequency for said frequency generator, and

masking means coupled to said means for changing to modify the digital display to indicate selected frequency ranges.

4,009,452

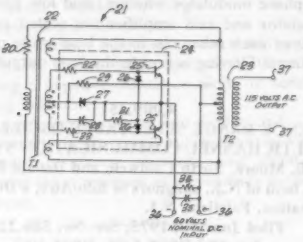
SUBMERSIBLE POWER PACKAGE

Allen R. Waltz, San Diego, and Howard B. McCracken, Poway, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,615

Int. Cl.² H03K 3/16

U.S. Cl. 331—68 **12 Claims**



1. A submarine power package for converting direct current electrical energy to alternating current electrical energy while being subjected to the intense pressure of deep ocean environments comprising:

a container;

circuit means effectively mounted within said container to be protected thereby and for converting electrical energy from direct to alternating current and including,

an inductively coupled solid state oscillator circuit employing pressure resistant semiconductor active elements therein for producing an alternating current output therefrom,

a coupling inductor connected to said semiconductor active elements:

a diode protection circuit preventing damage to said semiconductor active elements caused by inductor-coupled transient spike signals; and

an output transformer connected to said inductively coupled oscillator to transform the alternating current output therefrom to a desired voltage level for effective utilization thereof;

a flexible diaphragm effectively mounted in one surface of said container for transmitting fluid pressure of said deep ocean environment to the interior of said container; and

insulating oil contained within said container effectively filling the voids between said circuit means and the interior walls of said container.

4,009,453

NARROW-BAND INTERFERENCE FILTER AND ITS APPLICATION IN A LASER SYSTEM

Hans Mahlein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 14, 1975, Ser. No. 622,131

Claims priority, application Germany, Oct. 16, 1974, 2449312

Int. Cl.² H01S 3/08

U.S. Cl. 331—94.5 C **5 Claims**

1. In a narrow-band interference filter of the type wherein a plurality of alternating reflective layer structures are arranged in series form on a substrate, each structure having a layer construction pattern $(HL)^2H$, where H denotes a layer with a high index of refraction and L denotes a layer with a low index of refraction, and wherein spacing layers LL are arranged between adjacent layer structures, each of the layers having the same optical thickness, the improvement therein comprising:

means for providing infinitesimal reflection of light traversing the filter in one direction, said means including a plurality of absorbent metallic layers, each of said metallic layers having a thickness less than that of the layers H and L, each of said metal layers interposed between adjacent layers H and L of each of said layer structures, said metal layers asymmetrically effective in relation to reflection to provide reflection of light from one direction and infinitesimal reflection of light from the opposite direction.

4,009,454

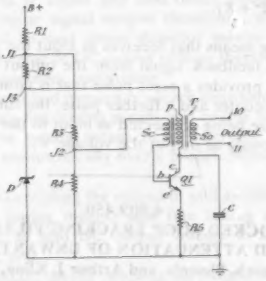
FAIL-SAFE CONSTANT AMPLITUDE SIGNAL GENERATOR

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Continuation of Ser. No. 108,264, Jan. 21, 1971, abandoned. This application June 26, 1975, Ser. No. 590,515

Int. Cl.² H03B 5/12

U.S. Cl. 331—117 R **10 Claims**



2. A fail-safe electronic circuit arrangement comprising a source of d.c. supply voltage, regulating means electrically connected to said source of d.c. supply voltage, oscillating circuit means having a resonant tank circuit means, a transformer coupled feedback circuit means and an output circuit means, said regulating means electrically connected to said resonant tank circuit means of said oscillating circuit means, and said regulating means employing its d.c. regulating char-

acteristic for regulating the d.c. supply voltage applied to said oscillating circuit means and utilizing its a.c. dynamic impedance characteristic for controlling the quality factor of said resonant tank circuit means so that an output signal is produced in said output circuit means when said regulated means is operating properly and so that an output signal is incapable of being produced in said output circuit means for both conditions when said regulating means is shortcircuited as well as when said regulating means is opencircuited.

4,009,455

PHASE LOCKED LOOP ANGLE MODULATION SYSTEM WITH LARGE MODULATION INDEX

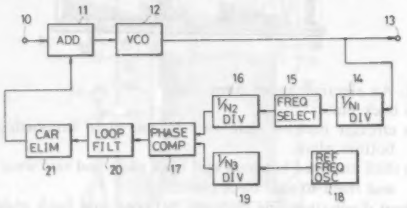
Yukinobu Ishigaki, Yamato, and Kiyotake Fukui, Settsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Victor Company of Japan, Limited, Yokohama, both of, Japan

Filed Sept. 11, 1975, Ser. No. 612,297

Claims priority, application Japan, Sept. 12, 1974, 49-104384; Sept. 12, 1974, 49-104385; June 19, 1975, 50-82671[U]

Int. Cl.² H03C *3/06*

U.S. Cl. 332—18 **6 Claims**



1. An angle modulation system comprising:

means for supplying a modulating signal;

a voltage controlled oscillator means operating at an oscillation frequency controlled by an applied signal, said voltage controlled oscillator naturally having an undesired side band:

frequency dividing means for dividing the output frequency of the voltage controlled oscillator with a specific frequency dividing ratio;

means for supplying a reference signal of a specific frequency;

phase comparison means jointly responsive to the output of the frequency dividing means and the reference signal from the reference signal supplying means;

frequency selection means in a path extending from the voltage controlled oscillator means, through the frequency dividing means, to the phase comparison means, said frequency selection means eliminating said undesired side band component from the output of the voltage controlled oscillator means;

adding means for adding the modulating signal and the output signal of the phase comparison means, and for applying the resulting signal to the voltage controlled oscillator means;

carrier elimination means in a path extending from the phase comparison means to the adding means for eliminating a frequency divided carrier component; and

means for deriving an angle-modulated signal from the output of the voltage controlled oscillator.

4,009,456

VARIABLE MICROWAVE ATTENUATOR

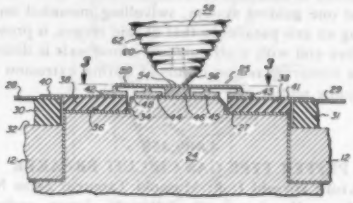
Samuel Hopfer, Brooklyn, N.Y., assignor to General Microwave Corporation, Farmingdale, N.Y.

Continuation-in-part of Ser. No. 78,891, Oct. 7, 1970, Pat. No. 3,713,037, which is a continuation-in-part of Ser. No. 788,254, Dec. 31, 1968, abandoned. This application Jan. 15, 1973, Ser. No. 323,856

The portion of the term of this patent subsequent to Jan. 23, 1990, has been disclaimed.

Int. Cl.² H01P *1/22*

U.S. Cl. 333—81 A **6 Claims**



1. A microwave device comprising:

microwave input and output means;

a first conductive element;

second, third and fourth conductive elements spacedly mounted from each other and from said first conductive element and generally parallel to said first conductive element;

semiconductor means mounted between opposing surfaces of said first conductive element and the others of said conductive elements and forming three separate conductive paths between said first element and each of said other elements;

and means for selectively applying bias signals to said conductive elements and for connecting said conductive elements in a network with two of said conductive paths associated with said second and fourth elements in series relation with said input and output means and the third of said paths associated with said third element in shunt with said input and output means.

4,009,457

ELECTRO-MAGNETIC CONTACTOR

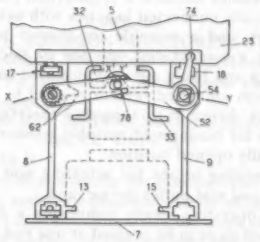
Jean-Pierre Guery, Poissy, and Guy Lacan, Carrieres-Sous-Bois, both of France, assignors to La Telemecanique Electrique, France

Filed June 17, 1975, Ser. No. 587,588

Claims priority, application France, Sept. 13, 1974, 74.31011

Int. Cl.² H01H *67/02*

U.S. Cl. 335—132 **6 Claims**



1. In an electro-magnetic contactor having a casing which includes two generally planar sections respectively constituting first and second parallel walls each having at its upper portion a system of slides, a base connecting said walls at their

lower portion, one or more contact-units received in said slide systems and including an actuating member having an inner portion slidingly mounted in said contact-unit and an outer portion adapted to be associated with a common coupling section which is placed between said parallel walls and is brought into movement by an electromagnet, the improvement that:

at least the first wall includes a first longitudinal cylindrical recess obtained during extrusion of said wall

at least one restoring system, acting upon said coupling section and an associated resilient member, is rotatingly mounted in said recess

at least one guiding system, swivelling mounted on a wall along an axis parallel to that of said recess, is provided at its free end with a articulation whose axis is determined by a centering recess obtained during extrusion of said coupling section.

4,009,458

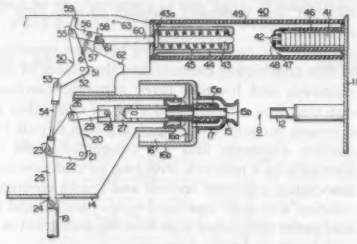
PUFFER TYPE GAS CIRCUIT BREAKER

Tuneo Kishi; Hiroshi Itoh; Masaoki Tamura; Seizo Nakano, and Masao Hosokawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1975, Ser. No. 568,179

Int. Cl.² H01H *33/82*

U.S. Cl. 200—148 A **6 Claims**



1. A puffer type gas circuit breaker of the type comprising:

a. an interrupter unit comprising

a main fixed contact, a main movable contact movably disposed in opposed relation with said main fixed contact between a position where it is in contact with and a position where it is separated from said main fixed contact, and a puffer device for compressing and blowing arc-affecting gases across the arc established between the main fixed and movable contacts when the same are separated from each other,

b. a preinsertion resistor contact unit electrically connected in parallel with the main fixed and movable contacts of the interrupter unit and comprising

a fixed resistor contact, a preinsertion resistor assembly electrically connected in series with said fixed resistor contact, and a movable rod-shaped resistor contact having a contact end opposed to said fixed resistor contact and being movably disposed in opposed relation with said fixed resistor contact to be moved into contact therewith or separated therefrom and having means for biasing said movable resistor contact into a normally opened position,

c. first operating means for actuating said main movable contact and said puffer device, and

d. second operating means comprising a driving member positioned so as to be pressed at one end thereof against the end of the movable rod-shaped resistor contact opposite to the contact end thereof, a pushing member having one end thereof disposed in opposed relation with said driving member, means for biasing said one end of said pushing member to be pressed against the other end of said driving member, linkage means mechanically connected between said first operating means and the other end of said pushing member for displacing said pushing member, said driving member, and said movable resistor contact from an original position where said movable and fixed resistor contacts are separated to a position where said movable and fixed resistor contacts are engaged, release means for disengaging the end of said pushing member from the end of said driving member, and means responsive to operation of said release means for returning only the movable resistor contact and driving member to their original positions immediately after said movable rod-shaped resistor contact engages with said fixed resistor contact and both the contacts of the interrupter unit are closed.

4,009,459

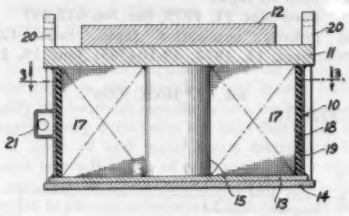
RESIN-EMPOTTED DRY-TYPE ELECTROMAGNET FOR DUSTY AND GASSEY LOCATIONS

William H. Benson, 2421 Plum St., Erie, Pa. 16501, and Gerald D. Rose, 2676 Hazel St., Erie, Pa. 16508

Filed May 5, 1975, Ser. No. 574,803

Int. Cl.² H01F *5/00, 27/08*

U.S. Cl. 335—300 **3 Claims**



1. An electromagnet comprising,

a back plate,

a circular bottom plate and a wear plate supporting said bottom plate,

a shell disposed between said back plate and said wear plate and fixed to said back plate,

heat dissipation fins disposed between said back plate and said wear plate and adjacent said shell and extending radially outwardly from said shell,

a winding disposed in said shell adjacent said back plate,

said winding and said shell defining a space therebetween,

said space being filled with an epoxy material that is filled with grains of material having a high coefficient of thermalconductivity.

4,009,460

INDUCTOR

Masahiko Fukui, Kumagaya, and Yasuji Kamata, Hitachi, both of Japan, assignors to Hitachi Metals, Ltd. and Hitachi, Ltd., both of, Japan

Filed Sept. 19, 1975, Ser. No. 614,943

Claims priority, application Japan, Sept. 24, 1974, 49-108752; Sept. 24, 1974, 49-108753

Int. Cl.² H01F *21/00*

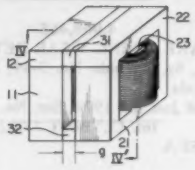
U.S. Cl. 336—110 **13 Claims**

1. An inductor comprising:

a first magnetic circuit which includes at least one magnetic core formed from a soft magnetic material, at least one airgap formed in a portion thereof, and a permanent magnetic member disposed in said one airgap to produce magnetic flux flowing through said first magnetic circuit;

a second magnetic circuit including at least one magnetic core formed from a soft magnetic material; the magnetic core of said second magnetic circuit being disposed face to face with the magnetic core of said first magnetic circuit; and

coil means wound around adjacent portions of said mag-



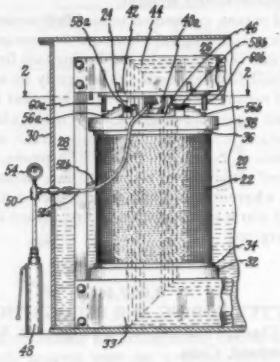
netic cores in common to produce a magnetic flux therein.

4,009,461

EXTERNALLY ACTUATED CLAMPING SYSTEM FOR TRANSFORMER WINDINGS INCORPORATING A MECHANICAL FOLLOW-UP DEVICE

Gerald O. Usry, Rome, Ga., assignor to General Electric Company

Filed July 24, 1975, Ser. No. 598,702
Int. Cl.² H01F 27/30
U.S. Cl. 336—197 10 Claims



1. In electrical apparatus of the type that is completely enclosed and mounted in a fixed relation with respect to said enclosure, having,

a magnetic core, said core having at least one leg,

winding structure, having a longitudinal axis, being disposed around said leg, said winding structure having first and second axial ends,

a rigid core-clamping frame mounted adjacent to and in a fixed relation with respect to said core,

a first force-distribution clamping plate positioned between one of said axial ends of said winding structure and said rigid core-clamping frame,

a second force-distributing clamping plate positioned between the remaining axial end of said winding structure and said rigid clamping frame, a hydraulic actuator, actuated externally of said electrical apparatus enclosure, capable of causing a compressive force to be applied to said first and second force-distributing clamping plates, the force generated by said hydraulic actuator being reacted against said rigid core-clamping frame,

the improvement which comprises:

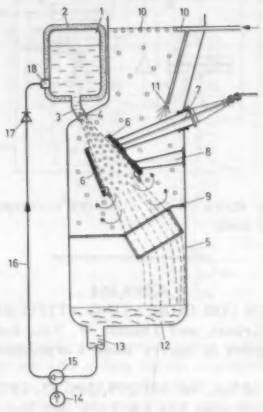
means automatically maintaining said force-generated by said hydraulic actuator at some predetermined minimum value dependent upon the maximum force applied by said hydraulic actuator, once said hydraulic actuator relaxes said compressive force below a predetermined value.

4,009,462

EAST ACTUATING WATER RESISTOR

Felix Bernasconi, Zollikerberg, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 25, 1975, Ser. No. 635,109
Claims priority, application Switzerland, Dec. 12, 1974, 16519/74
Int. Cl.² H01C 10/02
U.S. Cl. 338—80 8 Claims



1. A fast actuating water resistor of high power, particularly useful in thermal power plants operated with fossil or nuclear fuels for transient assumption of loads in the event of a sudden reduction in load or faults with the mains which comprises, a low-pressure steam boiler containing a pressurized hot highly electrically conductive aqueous solution, a tank, a jet nozzle connected with an outlet from said boiler for spraying the hot pressurized solution into said tank, a tubular electrode, means insulatively supporting said electrode within said tank in spaced relation to said nozzle and in axial alignment with said nozzle, a bus bar lead extending from said electrode outwardly through said tank, means insulatively supporting said bus bar lead within said tank, a collecting grid located at the discharge end of said electrode and in spaced relation therefrom, said hot pressurized solution being vaporized upon passage through said electrode and to said collecting grid thereby to establish a resistive electrical connection from said bus bar lead through said electrode and vaporized solution to said collecting grid, and a supplementary water distributor located in said tank above the respective supporting means for said bus bar lead and electrode and to which washing water is delivered.

4,009,463

ACOUSTIC EMISSION MONITORING SYSTEM

Leonard C. Vercellotti, Verona, and Perry J. Hite, Sr., Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1975, Ser. No. 558,107
Int. Cl.² G01S 5/18
U.S. Cl. 340—16 R 19 Claims

11. A method of monitoring the presence and source location of acoustic emissions generated within or on an acoustically conductive medium comprising the steps of:

segregating a surface of the medium into a plurality of quadrilateral monitoring zones;

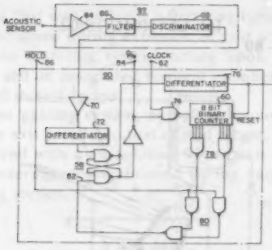
monitoring acoustic emissions communicated to the respective corners of the respective zones;

generating corresponding electrical signals representative of the acoustic emissions monitored;

employing the electrical signals to enable corresponding

counters to sequence through the counters respective counting states;

identifying the zone first encountering an acoustic reception at all its corresponding monitoring locations; and



reading the states of the counters corresponding to the identified zone.

4,009,464

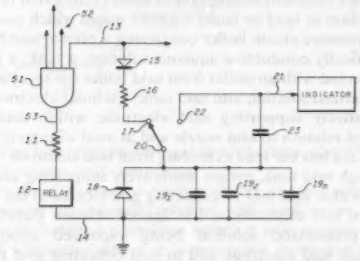
APPARATUS FOR INDICATING ATTITUDE FAILURE

Terrence L. Grimes, and Thomas W. Neis, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 541,299, Jan. 15, 1975, abandoned. This application Jan. 16, 1976, Ser. No. 649,886

Int. Cl.² G08B *21/00*

U.S. Cl. 340—27 AT **5 Claims**



1. In an aircraft indicator system operable from an electrical energy source and having a panel mounted indicator display for indicating to the pilot the attitude of the craft relative to the horizon and a remote vertical gyroscope for providing a horizon reference, electrical control apparatus for positioning said indicator display comprising:

motor means responsive to said vertical gyroscope and coupled through gears to said indicator display for normally positioning said indicator display in accordance with the position of said vertical gyroscope,

storage means coupled to said electrical energy source for storing electrical energy,

isolation means for isolating said storage means from said motor means during normal operation of said attitude indicator system,

sensing means responsive to a failure in said attitude indicator system, and

transfer means responsive to said sensing means for transferring the stored energy within said storage means to said motor means after a failure, the magnitude of the stored energy being sufficient to drive said indicator display to a position corresponding to an attitude indicating position greatly exaggerated from a normal aircraft attitude and wherein the motor means and the gears maintain said indicator display in said exaggerated position after dissipation of the stored energy thereby indicating a failure and warning the pilot not to rely on said attitude indicator system.

4,009,465

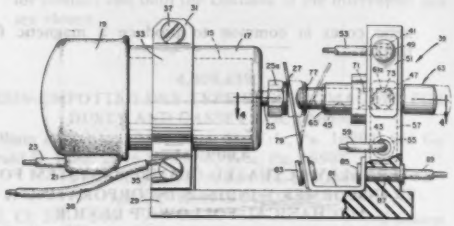
BRAKE LINING WEAR DETECTOR

Gonzalo Rigalt, 8a. Avenida No. 3-69, Zona 10 Guatemala City, Guatemala

Filed Jan. 28, 1974, Ser. No. 436,926

Int. Cl.² B60T *17/22*

U.S. Cl. 340—52 A **11 Claims**



1. In a vehicle having a brake and brake activator, apparatus for indicating the wear condition of brake linings when the linings have worn a predetermined amount, comprising:

a. first means energized when the brake linings have worn the predetermined amount;

b. second means, connected to said first means, for generating a first alarm signal when said first means is first energized, said second means generating said first alarm signal when said first means is subsequently de-energized, said second means including a first switch that is closed when said first means is energized and remains closed when said first means is subsequently de-energized; and

c. third means, connected to said first means, for generating a second alarm signal when said first means is first energized, wherein said third means does not generate said second alarm signal when said first means is subsequently de-energized.

4,009,466

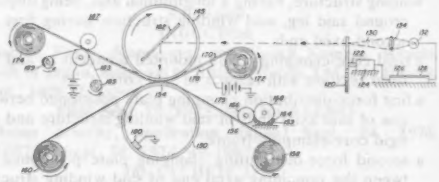
CHARACTER CODING AND RECOGNITION SYSTEM

Harold E. Clark, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 214,282, Dec. 30, 1971, Pat. No. 3,938,088. This application June 27, 1975, Ser. No. 591,242

Int. Cl.² G06K *7/12*

U.S. Cl. 340—146.3 B **2 Claims**



1. A method for forming coded characters which are recognizable both by an individual and a machine comprising:

directing into a polychromatic imaging suspension between two electrodes

light in color coded image character configuration, said light in color coded character configuration being coded by placing a multi-colored transparency in the path of light, said transparency comprising two or more parallel colored strips, no two adjacent strips being of the same color; and,

exposing said imaging suspension to said color coded light

image character while applying an electrical field across said suspension until an image is formed corresponding to said color coded light image character.

4,009,467

CHARACTER READER

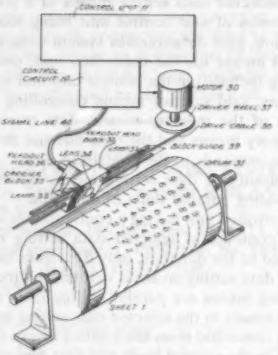
Tsuguo Kodera, Tokyo, and Kiyokazu Hanatani, Kawasaki, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Sept. 18, 1975, Ser. No. 614,418

Claims priority, application Japan, Sept. 28, 1974, 49-112203

Int. Cl.² G06K *9/08*

U.S. Cl. 340—146.3 H **2 Claims**



1. A character reader for recognizing characters recorded in equidistantly spaced lines on a sheet, each of the lines having a line mark recorded thereat, said character reader having scanning means positioned for scanning the lines of the sheet having characters recorded therein, said scanning means producing a scanning output signal, and recognition means for recognizing the recorded line mark in the scanning output signal produced by the scanning means for each line having characters recorded therein, said recognition means detecting the line marks and recognizing the characters in the lines corresponding to the line marks via the scanning output signal, said character reader comprising

positioning means for positioning the scanning means at a distance above a line being scanned sufficient to provide a scanning range between the upper and lower scanning limits of a line of characters relative to a center line through such line, said scanning range being greater than the distance between next-adjacent lines;

position detecting means for detecting where the line mark is located in the scanning range via the recognition means; and

extraction means for extracting the scanning output signal of the scanning means only when said scanning means scans within specified areas including the reference positions provided by the line marks detected by the position detecting means, said recognition means recognizing characters by recognizing the scanning output signal of the extraction means.

4,009,468

LOGIC NETWORK FOR PROGRAMMABLE DATA CONCENTRATOR

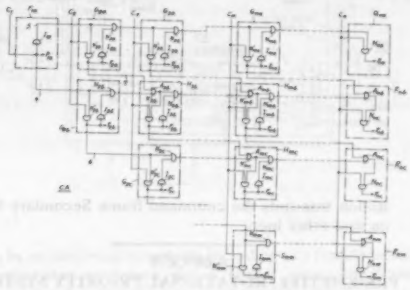
Piero Calcagno; Enzo Garetti, and Günter Lobisch, all of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed Apr. 4, 1975, Ser. No. 565,114

Claims priority, application Italy, Apr. 5, 1974, 68089/74

Int. Cl.² H04Q *3/00*; H04J *3/00*

U.S. Cl. 340—147 C **10 Claims**



1. A programmable data concentrator, comprising:

a logic network with *n* data inputs, *n* control inputs and *m* data outputs, *m* being smaller than *n;* and

circuitry for selectively energizing said control inputs in different combinations for transmitting binary signals from up to *m* data inputs to as many data outputs;

said network being divided into an enabling section provided with said control inputs and a performing section provided with said data inputs and outputs, said enabling section including a multiplicity of primary gating circuits, said performing section including a like multiplicity of secondary gating circuits individually associated with respective primary gating circuits of said enabling section for receiving activating signals therefrom upon the energization of correspondong control inputs, said primary gating circuits being interconnected in *m* preference chains permitting the emission of not more than one activating signal per chain, said performing section being provided with *m* summing circuits each connecting one of said data outputs to a number of secondary gating circuits associated with the primary gating circuits of a respective chain.

4,009,469

LOOP COMMUNICATIONS SYSTEM WITH METHOD AND APPARATUS FOR SWITCH TO SECONDARY LOOP

Paul Emile Boudreau, Ridgefield, Conn., and Brian Barry Moore, Wappingers Falls, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,278

Int. Cl.² H04Q *9/00*; G06F *11/00*; G05B *23/02*; H04J *3/14*

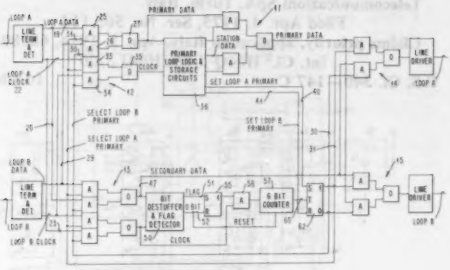
U.S. Cl. 340—147 SC **6 Claims**

1. In a loop communication system wherein a remote station has switching means for making a primary connection to a selected one of two loops and a secondary connection to the other of said two loops and wherein a central station has means for transmitting command frames having a beginning flag, 32 bits, and an ending flag, the improvement comprising,

means at a remote station for detecting the occurrence on said other loop of a flag followed by 32 consecutive 1 bits of a command frame Secondary Switch,

means responsive to said detecting means for operating said

switching means to switch said remote station of a primary connection to said other loop when said control



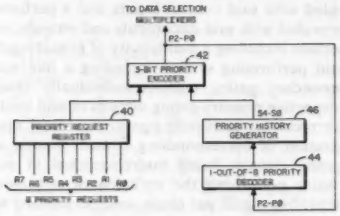
station transmits the command frame Secondary Switch on said other loop.

4,009,470

PRE-EMPTIVE, ROTATIONAL PRIORITY SYSTEM

Michael Danilenko, West St. Paul; James Robert Davis, Jr., New Brighton, and Arthur Flets Boehm, St. Paul, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,800
Int. Cl.² G06F *3/04, 9/18*
U.S. Cl. 340—172.5 **9 Claims**



1. A priority system, comprising:

priority encoder means adapted to receive selected ones of R priority request signals during successive memory cycles, where R is a positive integer of 4 or greater having a descending ordered pre-emptive priority, said R priority request signals being arranged in at least first and second groups of priority request signals of at least first and second priority request signals per group, for generating output signals that identify the one priority request signal that is to be granted priority during each one of said successive memory cycles;

priority history generator means responsively coupled to said priority encoder means output signals for accumulating and storing the priority history of the priority request signals that have been granted priority over said successive memory cycles and generating output signals that define the stored priority history of said priority request signals; and

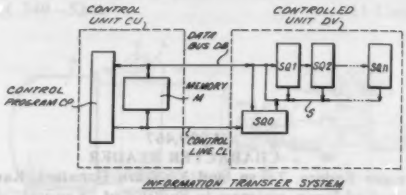
means coupling said priority history generator means output signals to said priority encoder means and conditioning said priority encoder means to encode said R priority request signals during each of said successive memory cycles for rotating priority between the priority request signals within eachh of said first and second groups of priority request signals and between said first and second groups of priority request signals during each of said successive memory cycles.

4,009,471

INFORMATION TRANSFER SYSTEM

Atsuo Tanaka, Kanagawa; Koichi Tokura, Chiba, and Hiroki Kawahara, Kawasaki, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed June 20, 1975, Ser. No. 588,701
Claims priority, application Japan, June 24, 1974, 49-72061
Int. Cl.² G06F *13/00;* **G11C** *19/00*
U.S. Cl. 340—172.5 **4 Claims**



1. A data transfer system having a control unit, a controlled unit having a plurality of *n* data setting means and data bus and control leads, said control unit being connected to said controlled unit via said data bus and control leads, the contents of selected data setting means of a plurality of *n* data setting means of said control unit being modified from said control unit, said data transfer system comprising

control means for the controlled unit, said control means being included in the control unit and including memory means, said control means controlling the handling of data of the memory means, data transfer between the memory means and the data bus and the transmission of the commands to the controlled unit,

the plurality of data setting means having configurations providing parallel shifts of data, and

the controlled unit having a configuration which is such that the contents of selected data setting means are transferred to the data bus, only data from the data bus to the first data setting means is written, and the plurality of data setting means are parallel shifted from the first data setting means to the selected data setting means on the basis of a command from the control means for the controlled unit to the control leads and data bus, whereby when the contents of the ith data setting means of the controlled unit, wherein $i \leqq n$, are to be modified from the control unit, the contents of the first to $(i-1)$th data setting means are transferred to the bus bar in accordance with commands sequentially issued from the control means for the controlled unit for the contents of said data setting means, and data on the data bus is sequentially stored in the memory means, the control means for the controlled unit thereafter transferring data to be modified to the data bus and issuing write commands thereby setting modification data in the first data setting means, and the control means for the controlled unit thereafter sequentially reads out data stored in the memory means, transfers the read out data to the data bus and issues parallel shift and write commands for the first to ith data setting means whenever data is transferred whereby the contents of the ith data setting means are modified.

4,009,472

DYNAMIC ASSOCIATIVE CELL

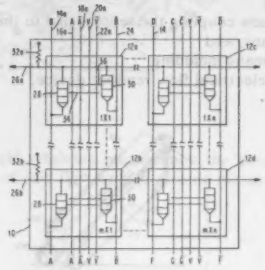
John Wyn Jones, Winchester, England, assignor to IBM Corporation, Armonk, N.Y.

Filed May 16, 1975, Ser. No. 578,300
Int. Cl.² G11C *15/00*
U.S. Cl. 340—173 R **6 Claims**

1. In an array for performing logic functions a new storage cell comprising;

two, three terminal semi-conductive devices,

an output line coupled through a load device to a source of potential and to a first terminal of both the transistors, input lines for carrying the true and complement of at least two input variables and two different reference levels, one of the reference levels representing an up logic level of the input variables and the other reference level representing a down logic level of the input variables, and



connection means for coupling a second terminal of one of the semi-conductive devices to an input level carrying the true of one input variable and the second terminal of the other transistor to the input line carrying the complement of the same input variable and selective connection means for selectively connecting the third terminal of the semi-conductive device to at least one of the other input lines whereby one of sixteen logic functions of two variables can be performed by the storage cell.

4,009,473

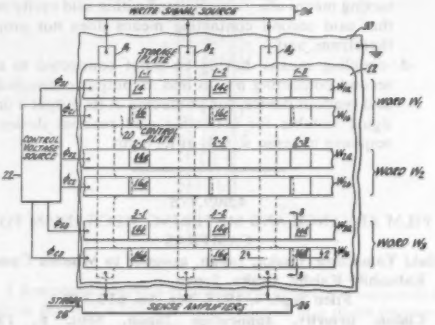
CHARGE COUPLED MEMORY SYSTEM

Joseph R. Burns, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 106,357, Jan. 14, 1971, abandoned. This application June 9, 1975, Ser. No. 585,409

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **4 Claims**



1. The combination of:

a charge-coupled device memory including a plurality of memory locations, each such location including means for storing charge signals,

an optical memory having a plurality of storage locations for producing, when read out, a light pattern output indicative of the information stored in said locations;

means for producing a charge pattern in said charge coupled device memory corresponding to the information stored in said optical memory comprising means for reading out said optical memory and for applying the light pattern thereby obtained indicative of the information stored in said locations of said optical memory onto locations of the charge-coupled device memory for producing charge signals for storage in the charge coupled device memory.

4,009,474

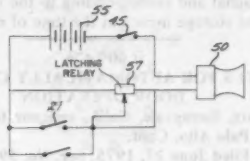
ALARM SYSTEM FOR ELECTRICAL RECEPTACLES

Chauncey B. Eller, 23100 Vista Grande Way, Colton, Calif. 92324

Filed Feb. 26, 1976, Ser. No. 661,744

Int. Cl.² G08B *13/02*

U.S. Cl. 340—280 **7 Claims**



1. In an electrical receptacle including two female terminals for electrical excitation and a female grounding terminal formed in a housing the improvement comprising:

a transverse slot formed partly across said grounding terminal;

a spring biased arm connected at one end thereof to said housing and arranged to align within said slot for intersecting said grounding terminal;

a switch connected to said housing and aligned to be closed by the free end of said arm when said arm is intersecting said grounding terminal and to be opened upon the displacement of said arm by an electrical connector insertable in said grounding terminal; and

alarm means connected in circuit with said switch.

4,009,475

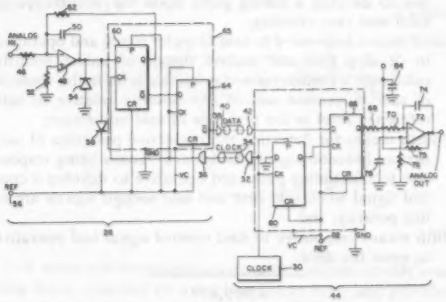
DELTA-SIGMA CONVERTER AND DECODER

Richard E. DeFreitas, Westford, Mass., assignor to Hybrid Systems Corporation, Burlington, Mass.

Filed Dec. 5, 1974, Ser. No. 529,639

Int. Cl.² H03K *13/20*

U.S. Cl. 340—347 AD **7 Claims**



2. A converter for transforming an input analog signal level into a pulse rate comprising:

means for integrating said analog signal level in combination with a feedback signal to provide an integrator output signal;

means for providing a clock signal;

a first bistable storage means including an input characterized by a threshold level, an output, and a clock signal input, the output signal therefrom having two levels and

being representative of the magnitude of a signal applied to the input relative to the threshold level at the last occurrence of said clock signal;

said integrator output signal being applied to the storage means input;

said output signal from said first storage means providing the feedback signal of a polarity to cause said integrator to integrate on opposite signs slope upon the occurrence of one of the output levels from said bistable storage means; and

a second bistable storage means operative in association with said first storage means and responsive to said clock signal for providing an output pulse coincident with each clock signal and corresponding to the output level from said first storage means at the time of each clock signal.

4,009,476

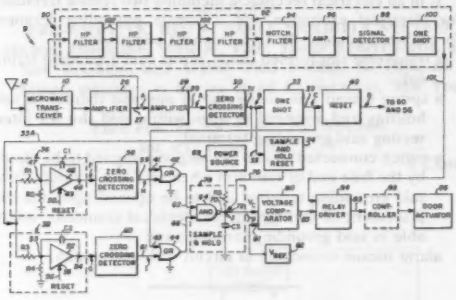
APPARATUS FOR AUTOMATICALLY CONTROLLING DOOR OPERATION

Erno B. Lutz, Sunnyvale, Calif., assignor to Solfan Security Systems, Palo Alto, Calif.

Filed June 27, 1975, Ser. No. 590,811

Int. Cl.² G01S *9/02*; E05F *15/20*

U.S. Cl. 343—7 ED **11 Claims**



1. An apparatus for automatically controlling the operation of a door comprising:

first means responsive to detect the movement of a randomly moving object and operative to develop a Doppler signal representative of such movement, said Doppler signal being generally sinusoidal with a zero crossing in each cycle;

second means responsive to said Doppler signal and operative to develop a timing pulse upon the occurrence of each said zero crossing;

third means responsive to said Doppler signal and operative to develop first and second signals of unlike polarity relative to a predetermined reference level in the absence of said movement and of like polarity relative to said reference level in the presence of said movement;

fourth means for detecting the respective polarities of said first and second signals, said fourth means being responsive to said timing pulse and operative to develop a control signal when said first and said second signals are of like polarity; and

fifth means responsive to said control signal and operative to open the door.

4,009,477

WATTMETER HOUSING FOR A POWER CARRYING LINE

Edward Francis Rozylowicz, Villa Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1976, Ser. No. 646,452

Int. Cl.² G01R *1/04*

U.S. Cl. 324—156 **14 Claims**

1. Apparatus for measuring electrical flow on a line comprising:

coupler means including

a. a coupler body means adapted for permanent coupling to the line,

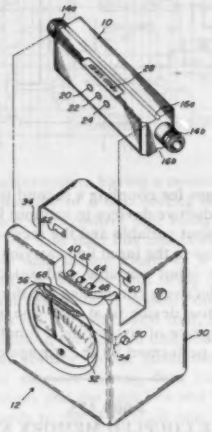
b. sense means for sensing the electrical flow on the line and producing a sense signal representative of the magnitude thereof,

c. first electrical contacting means affixed in a predetermined position with respect to said coupler body such that said contacting means does not project therefrom, and

d. means coupling the sense signal to the first contacting means; and

meter means including

a. an electrical flow readout device,



b. a housing means adapted for housing said readout device, said housing provided with a cavity adapted to receive said coupler body means,

c. second contacting means located to electrically contact said first contacting means upon entrance of said coupler means into said housing cavity said second contacting means also being located within said cavity such that said second contacting means does not project therefrom, and

d. coupling means, having an input connected to said second contacting means and an output connected to said readout device, for producing at its output a drive signal suitable for activating said readout device in response to sense signals at its input.

4,009,478

FILM ADVANCE AND METERING MECHANISM FOR CAMERAS

Maki Yamashita, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 4, 1975, Ser. No. 610,348

Claims priority, application Japan, Sept. 6, 1974, 49-101956

Int. Cl.² G03B *1/22*

U.S. Cl. 354—206 **10 Claims**

1. In a camera loaded with a film having a row of longitudinally spaced perforations, one for each frame, a film transport and metering mechanism comprising:

an operating member operable for transporting said film;

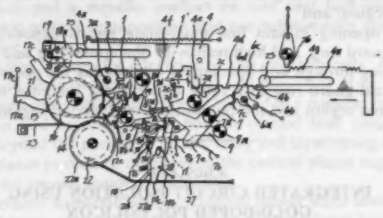
a sensing member for sensing a perforation of said film;

film wind-up means for winding-up said film;

intermediate means releasably connected with said operating member for transmitting the operation of said operating member to said film wind-up means;

means for retaining the connection of said intermediate means with said operating member; and

means for releasing the retention of said intermediate



means by said retaining means upon the detection of a perforation of said film by said sensing member.

4,009,479

JOSEPHSON JUNCTION

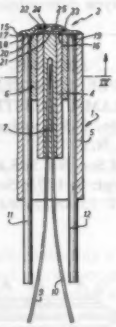
Philippe Cardinne, Grenoble; Francois Colomb, Echirolles; Bernard Manhes, Grenoble, all of France; James Emery Nordman, Madison, Wis., and Raymond Serve, Eybens, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Dec. 21, 1973, Ser. No. 427,262

Claims priority, application France, Mar. 30, 1973, 73.11541

Int. Cl.² H01L *39/22, 23/02*

U.S. Cl. 357—5 **6 Claims**



1. A Josephson junction comprising a cylindrical supporting substrate that has a flat end face disposed in a plane perpendicular to the axis of the cylindrical substrate, said cylindrical substrate comprising a body of insulating material elongated in a direction parallel to the axis of said cylindrical substrate and first and second electrical conductor means extending longitudinally along and spaced from each other by said insulating material, said body of insulating material and said electrical conduetor means terminating respectively in a transverse insulating zone and first and second conductive zones, all said zones forming said flat end face, a first blade of superconductive material extending face-on-face exclusively on said first conductive zone, an electrical barrier film on said first blade of superconductive material, and a second blade of superconductive material disposed face-on-face on said electrical film barrier and extending transversely along said flat end to said second conductive zone.

4,009,480

ROLL FILM CAMERA FOR USE WITH VARIOUS SIZED MAGAZINES

Tomonori Iwashita, Chofu; Hiroshi Aizawa, Machida; Susumu Kozuki, Yokohama, and Masanori Uchidoi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1975, Ser. No. 549,681

Claims priority, application Japan, Feb. 16, 1974, 49-18817; Feb. 16, 1974, 49-18818

Int. Cl.² G03B *1/00*

U.S. Cl. 354—210 **5 Claims**

1. A roll film camera comprising a camera body, a large capacity film magazine adapted for attachment to the rear of said camera body, magazine supply and take-up spools rotatably mounted within said magazine, a film transport mechanism included in said camera body, said film transport mechanism having a camera body take-up spool and driving means operatively associated therewith, clutch means operatively arranged between said camera body take-up spool and said driving means, and actuating means for said clutch means to operatively disconnect said camera body take-up spool from said driving means in automatic response to attachment of said magazine to the rear of said camera body.

4,009,481

METAL SEMICONDUCTOR DIODE

Klaus Reindl, Sherman, Tex., assignor to Siemens Aktiengesellschaft, Munich and Berlin, Germany

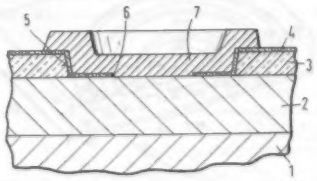
Continuation of Ser. No. 95,048, Dec. 4, 1970, abandoned. This application Aug. 16, 1972, Ser. No. 281,162

Claims priority, application Germany, Dec. 15, 1969, 1962814

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01L *29/48*

U.S. Cl. 357—15 **2 Claims**

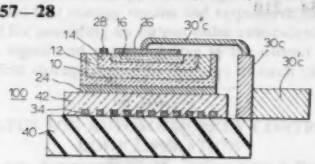


1. A metal semiconductor diode with a silicon dioxide insulating layer, arranged on a semiconductor body and provided with a first contact window, a silicon nitride insulating layer which is thinner than the silicon dioxide insulating layer on said silicon dioxide insulating layer, said silicon nitride insulating layer having therein a second contact window which is 10 to 30 μm smaller than the first contact window, so that said silicon nitride insulating layer covers the edge of the surface of the semiconductor body which emerges through the first contact window and contact metal is provided in the first and in the second contact windows, said silicon dioxide layer being 0.4 to 0.8 μm thick and said silicon nitride layer being 100 – 500 A thick.

4,009,482
SEMICONDUCTOR THERMALLY SENSITIVE SWITCH STRUCTURE

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 506,772, Sept. 17, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,872
Claims priority, application Japan, Sept. 26, 1973, 48-108107
Int. Cl.² H01L 23/56, 29/66, 29/74; B22D 1/00
U.S. Cl. 357—28 7 Claims

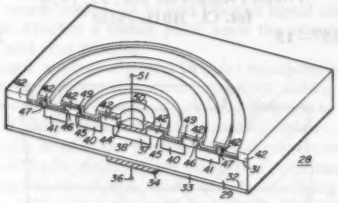


1. A semiconductor thermally sensitive switch structure comprising a thermally sensitive semiconductor switch element including at least four semiconductor layers of alternate conductivity and having p-n junctions between said layers and which element can change between stable conducting and nonconducting states at a switching temperature and which is self-held in the nonnconducting state, electrode means on said switch element for connecting said switch element in an electrical circuit for switching the current flow in the circuit, and heater means on said switch element for heating said semiconductor switch element to switch the latter from its nonconducting state to its conducting state, said heater means being electrically insulated from said semiconductor switch element.

4,009,483
IMPLEMENTATION OF SURFACE SENSITIVE SEMICONDUCTOR DEVICES

Lowell E. Clark, Paradise Valley, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 457,949, April 4, 1974, abandoned, which is a continuation of Ser. No. 240,634, April 3, 1972, abandoned. This application Sept. 2, 1975, Ser. No. 609,886
Int. Cl.² H01L 29/34, 29/40, 29/72
U.S. Cl. 357—52 2 Claims



major surface, but entirely without said plane, and wherein the central planar region of said first major surface and a metallic contact on said first face are in a face-to-face juxtaposition and are substantially coextensive;

bonding means for electrically and mechanically uniting said semiconductor body and said mounting plate;

at least one ribbon-shaped lead bonded to a metallic contact on said second face, a portion of said lead projecting beyond the periphery of said body and terminating with a planar portion in the plane of the central planar region of said second major surface; and

a ceramic substrate with conductive planar leads laminated thereto, wherein a bonding area of one planar lead is in registry with and bonded to the central planar region of said second major surface, and a bonding area of another planar lead is in registry with and bonded to said planar portion of said ribbon-shaped lead, and each of said planar leads has a contact area spatially separated from said semiconductor body for connection to an external circuit.

4,009,486

DIGITAL ENCODING SYSTEM

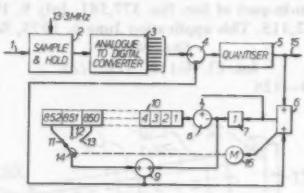
John Edward Thompson, Watford, England, assignor to The Post Office, London, England

Filed Aug. 20, 1975, Ser. No. 605,994

Claims priority, application United Kingdom, Aug. 23, 1974, 37280/74

Int. Cl.² H04N 9/02

U.S. Cl. 358—13 **12 Claims**



1. A method of digitally encoding a PAL colour television signal having a base band luminance component and a phase and amplitude modulated sub-carrier wave representing chrominance, the sense of the phase modulation being switched about a datum phase so as to alternate in successive lines, in which at each of a regular succession of sampling instants an instantaneous value of the signal has subtracted from it a combination of previously sampled values of the signal, the difference being encoded in digital form; wherein the sampling frequency is three times the frequency of the sub-carrier, with sampling instants synchronised with the datum phase of the sub-carrier or a phase in quadrature with the datum phase, and the value of the signal at a present sampling instant has subtracted from it both the value at a preceding sampling instant and the difference between the values at first and second sampling instants approximately one line period earlier, the value at the first sampling instant being subtracted from the value of the second sampling instant to produce the last-mentioned difference, the first and second sampling instants being chosen so that they are spaced the same number of sampling intervals as the present and preceding sampling instants, and that the sub-carrier components, if unmodulated, would cancel each other.

4,009,487

BLANKING GENERATOR FOR PAL SYNC SIGNALS

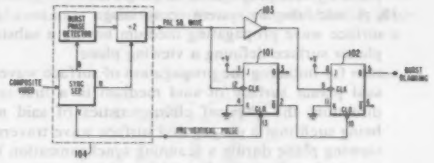
William Joseph Derenbecher, Jr., Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 645,184

Claims priority, application United Kingdom, Apr. 4, 1975, 13965/75

Int. Cl.² H04N 9/46

U.S. Cl. 358—19 **6 Claims**



1. A blanking generator for PAL television signals, comprising:

a first source of periodic signals at one-half the horizontal line rate having first and second polarity transitions;

a source of periodic enabling signals related to the vertical field rate having a duration equal to a multiple of said horizontal line rate;

first logic means responsive to said first signal source, said first logic means being enabled by said enabling signal for providing a first output signal at the first polarity transition of said first signal to occur after application of said enabling signal;

second logic means responsive to said first signal and said first output signal for providing a second output signal from said second logic means at the second polarity transition of said first signal occurring after said enabling signal duration;

said second output signal being equal in time to the duration of said enabling signal, but displaced in time to be coincident with the first polarity transition of said first signal to occur after application of said enabling signal.

4,009,488

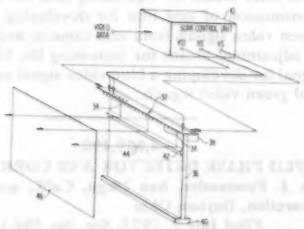
VIDEO DISPLAY SYSTEM AND METHOD EMPLOYING PROPAGATING STRESS WAVES

Ronald S. Smith, CMR Box 2509 USASAFS Augsburg, A.P.O. New York, N.Y. 09458

Filed May 1, 1975, Ser. No. 573,611

Int. Cl.² H04N 9/31; G02F 1/11

U.S. Cl. 358—62 **19 Claims**



1. A video display system comprising:

a stress wave propagating means defining a viewing plane and including means for initiating the propagation of stress waves along said propagating means in a first scanning direction in said viewing plane; and

means for emitting light selectively modulated in intensity by a video signal along a scan line in a second scanning direction generally perpendicular to said first scanning direction, said light emitting means being disposed in

relation to said stress wave propagating means to emit light incident upon each of said stress waves propagated along said propagating means over the extent of the viewing plane in said first scanning direction so that the emitted light interacts with said propagated stress waves over a scanning interval in said first scanning direction and so that the light emitted and selectively modulated along said scan line in said second scanning direction is scanned in said first scanning direction over said viewing plane by said propagated stress waves.

18. A video display system comprising:

a surface wave propagating medium having a substantially planar surface defining a viewing plane;

means for initiating the propagation of surface waves along said planar surface of said medium in a first scanning direction, the physical characteristics of said medium being such that a propagated surface wave traverses said viewing plane during a scanning synchronization interval in said first scanning direction; and,

a plurality of light sources disposed to emit light at discrete positions spaced along a scan line in a second scanning direction generally perpendicular to said first scanning direction, said light sources being individually controllable to emit light modulated by a video signal incident upon said propagated surface wave over the extent of said viewing plane.

4,009,489

NEGATIVE COLOR FILM MASK CORRECTION

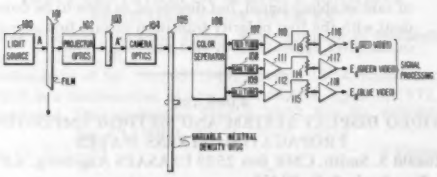
Harold George Seer, Jr., Woodbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,615

Claims priority, application United Kingdom, Aug. 6, 1975, 32843/75

Int. Cl.² G03F *3/08*; **H04N** *9/11*, *5/84*

U.S. Cl. 358—80 **5 Claims**



1. Apparatus for processing negative color film in a telecine camera which develops red, green and blue color video signals, said negative film having unequal light transmission for red, green and blue light components, comprising:

optical filter means for equalizing said red and green light transmission of said film for developing equal red and green video signals from said camera; and

gain adjustment means for increasing the blue color video signal for developing a blue video signal equal to said red and green video signals.

4,009,490

PLO PHASE DETECTOR AND CORRECTOR

Charles J. Fassbender, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed July 7, 1975, Ser. No. 594,144

Int. Cl.² G11B *5/09*

U.S. Cl. 360—45 **13 Claims**

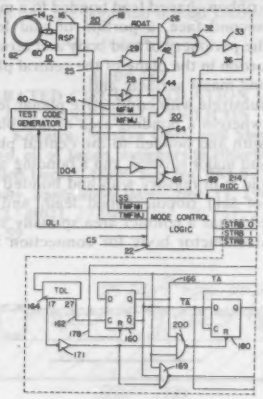
1. In a data retrieval system of the type recovering data stored as flux transitions on a magnetic-medium data source, the stored data having data signals and clock signals inherent therein, data recovery circuits comprising:

means for generating a bit-string having a predetermined pattern representative of the stored data;

means coupled to the bit-string generating means for detecting clock signals of an input bit-string;

means responsive to the clock-signal detecting means for generating a framing signal;

means receiving the framing signal and responsive thereto for detecting data signals of the input bit string; and



means for coupling the bit-string generating means to the datasignal detecting means, the coupling means including means for selectively positioning the data signals with respect to the framing signal.

4,009,491

DISTORTIONLESS MODULATION HEAD

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Division of Ser. No. 501,037, Aug. 28, 1974, which is a continuation-in-part of Ser. No. 377,581, July 9, 1973, Pat. No. 3,862,115. This application June 6, 1975, Ser. No. 584,399

Int. Cl.² G11B *5/12*, *5/25*

U.S. Cl. 360—125 **12 Claims**

1. A magnetic head, comprising in combination:

a straight magnetizable one-piece core, having two ends, elongated between the two ends, and having a cavity extending only from one of the two ends into the core, said one of the two ends being a transducing area; and

a coil formed on and circumjacent at least a portion of the core.

4,009,492

VIDEO RECORDING AND/OR REPRODUCING MEDIUM

Nobutoshi Kihara, and Osamu Shimada, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 485,549, July 3, 1974, Pat. No. 3,964,095. This application Feb. 24, 1976, Ser. No. 660,974

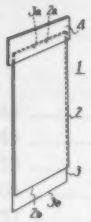
Claims priority, application Japan, July 11, 1973, 48-78600

Int. Cl.² G11B *5/74*, *25/00*, *19/00*

U.S. Cl. 360—131 **6 Claims**

1. A recording medium comprising at least first and second flexibly resilient, substantially rectangular sheets normally disposed in closely adjacent, confronting relation and being of

different sizes so that at least one edge of one of said sheets projects beyond the adjacent edge of another of said sheets for ease in separating substantial portions of said sheets from each other, at least said first sheet being adapted to have signal



information recorded thereon and reproduced therefrom when said substantial portions of the sheets are separated from each other, and signal information recorded on said first sheet being protected by the remainder of said sheets when the latter are in said closely adjacent, confronting relation.

4,009,493

CASSETTE RECORDING APPARATUS WITH AUTOMATIC LOADING

Gerhard Habelt, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1975, Ser. No. 595,707

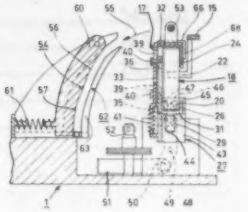
Claims priority, application Austria, July 17, 1974, 5928/74

Int. Cl.² G11B *23/08, 19/00*

U.S. Cl. 360—137 **7 Claims**

1. A cassette recording apparatus for cassettes having a first side and a second side perpendicular to the first side, the second side having a location for operative scanning for a record carrier in the cassette by a scanning element, comprising a cassette container; means for moving the cassette container from a loading to an operating position; and means for feeding a cassette with said first side first from a feed-in position in the apparatus into the container when the container is in a loading position;

wherein said moving means comprises a container support, a scanning element rigidly mounted on the support outside said container when the container is in said loading position; and when a cassette is in the container, said element being opposite a second side of the cassette,



means for moving the support from a loading to an operating position, and

control element means for moving said container with respect to said support responsive to movement of said support from said loading position toward said operating position, such that when a cassette is in the container said second side will be brought into operative engagement with the scanning element before the container reaches the operating position.

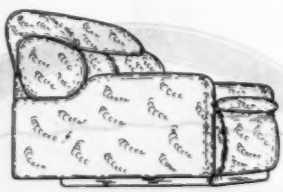
DESIGNS

FEBRUARY 22, 1977

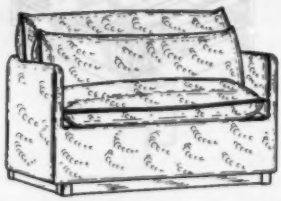
243,421
SPORT SHOE
William J. Cohen, Hingham, Mass., assignor to CITC Industries, Inc., New York, N.Y.
Filed July 31, 1975, Ser. No. 600,711
Term of patent 14 years
Int. Cl. C2—*04*
U.S. Cl. D2—310

243,422
TONGUE BRUSH
Ilona D. Varga,.14 Beverly Road, Torrington, Conn. 06790
Filed Nov. 4, 1974, Ser. No. 520,726
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

243,423
UPHOLSTERED SEAT
Alberto Rosselli, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy
Filed July 14, 1975, Ser. No. 595,407
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

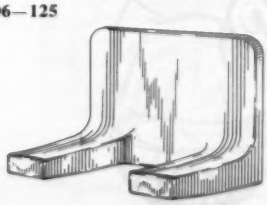


243,424
UPHOLSTERED SEAT
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy
Filed July 14, 1975, Ser. No. 595,408
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

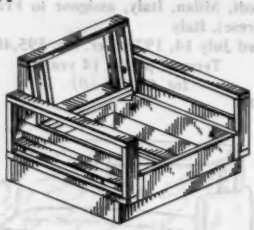


243,425
CHAIR
Sidney Gibson, 229 Deloraine Ave., Toronto, Ontario, Canada
Filed Oct. 21, 1975, Ser. No. 624,450
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

243,426
HOT COMB HOLDER
John A. Joslyn, 2441 N. 111th St., Wauwatosa, Wis. 53213
Filed Feb. 26, 1976, Ser. No. 661,474
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



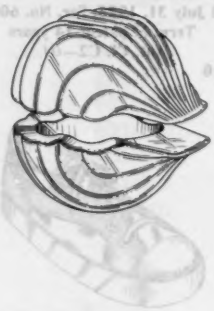
243,427
FRAME FOR A SEAT
William R. Watts, Rte. No. 1, P.O. Box 320-1, Millsboro, Del.
Filed Aug. 27, 1975, Ser. No. 608,027
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



243,428
COVERED FOOD BOWL OR SIMILAR ARTICLE
James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed July 28, 1975, Ser. No. 599,835
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—5

243,429
COVERED FOOD BOWL OR SIMILAR ARTICLE
James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Aug. 13, 1975, Ser. No. 604,444
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—5

243,430
COVERED FOOD BOWL OR SIMILAR ARTICLE
James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Oct. 23, 1975, Ser. No. 625,203
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—5



243,431
GOBLET OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 397,069, Dec. 13, 1973, Pat. No. D238,541. This application Jan. 29, 1975, Ser. No. 544,913
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—11

243,432
PLATE OR THE LIKE
Ottorino N. Mercadante, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed July 18, 1975, Ser. No. 597,218
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—36

243,433

PITCHER OR SIMILAR ARTICLE

Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 380,272, July 18, 1973, Pat. No. D237,031. This application Dec. 5, 1974, Ser. No. 529,746

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—64

243,434

PITCHER

Richard E. R. Cone, Dallas, Tex., assignor to Plastics Manufacturing Company, Dallas, Tex.

Filed Apr. 9, 1975, Ser. No. 566,540

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—64

243,435

COMBINED TABLE PLACE MAT AND NAPKIN HOLDER

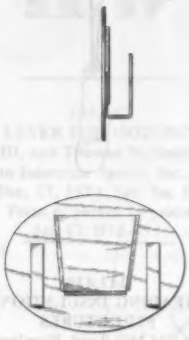
Beulah J. Hoffman, 160 S. Monaco Blvd., Denver, Colo. 80222

Filed Feb. 25, 1976, Ser. No. 661,315

Term of patent 14 years

Int. Cl. D6—*04*; D7—*06*

U.S. Cl. D7—72



243,436

BARBECUE GRILL

Kenneth J. Vida, 6200 Canterbury Drive, Apt. 309, Culver City, Calif. 90230

Filed Apr. 26, 1976, Ser. No. 679,987

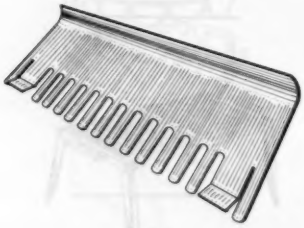
Term of patent 14 years

Int. Cl. D7—*04*

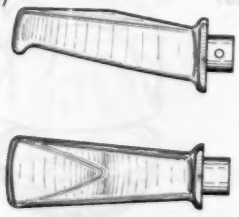
U.S. Cl. D7—107

243,437
ARTICLE OF FLATWARE
William J. Knope, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed May 21, 1975, Ser. No. 579,450
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

243,438
RAKE FOR SPREADING INSULATION IN BUILDING STRUCTURES
Ray E. Batley, 7325 Old Mill Road, Birmingham, Mich. 48010
Filed July 7, 1975, Ser. No. 593,364
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16

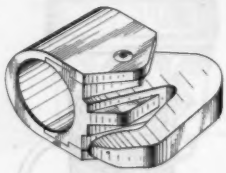


243,439
HANDLE FOR A PERCUSSION TOOL OR THE LIKE
Stig Rune Zernell, Johanneshov, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed July 29, 1975, Ser. No. 600,005
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—107



243,440
SUPPORT HOOK FOR SHELVES OR THE LIKE
Nils Erik Strinning, St. Sulpice, Switzerland, assignor to String-Seffle Mobelfabrik AB, Saffle, Sweden
Filed Aug. 1, 1975, Ser. No. 600,966
Claims priority, application Germany, Feb. 3, 1975, 7503156[U]
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—381

243,441
HOOK
Alexander L. Podd, 306 University Ave., Apt. 21, Fredericton, New Brunswick, Canada
Filed May 28, 1975, Ser. No. 581,585
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

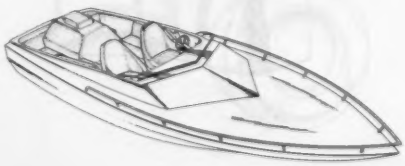


243,442
BOTTLE
Robin M. Montgomery, Sherman Oaks, Calif., assignor to Max Factor & Co., Hollywood, Calif.
Filed Mar. 10, 1975, Ser. No. 556,869
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—73

243,443
COMBINED DISPLAY CARD AND HOLDER FOR A CYLINDRICAL ARTICLE
Tadaaki Hayashi, 15-13, Midori, 5-chome, Koganei, Tokyo, Japan
Filed Oct. 6, 1975, Ser. No. 620,095
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191

243,444
CLOCK FACE
Daniel L. Miller, 3757 S.W. 27th Lane, Miami, Fla. 33134
Filed June 5, 1975, Ser. No. 583,861
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—8

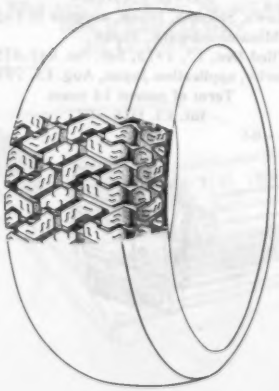
243,445
BOAT
Nasim Khoury, San Marino, Calif., assignor to Bell Industries, Los Angeles, Calif.
Filed Dec. 3, 1975, Ser. No. 637,165
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



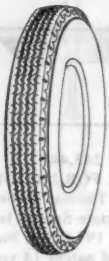
243,446
SAILBOAT
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.
Filed July 17, 1975, Ser. No. 596,762
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64

243,447
FOOT LEVER FOR MOTORCYCLES
Grover C. Smith, III, and Thomas M. Smith, both of Houston, Tex., assignors to Interstate Sports, Inc., Fulshear, Tex.
Filed Dec. 17, 1974, Ser. No. 533,701
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

243,448
PNEUMATIC TIRE TREAD AND BUTTRESS
Gerhard Franz-Josef Senger, Aachen, Germany, assignor to Uniroyal A.G.
Filed Mar. 4, 1976, Ser. No. 663,883
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136



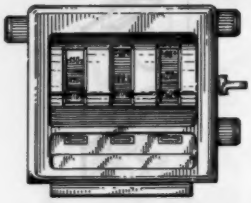
243,449
VEHICLE TIRE
Toshio Hayakawa, Kodaira, and Masao Nakamura, Higashi-Murayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed May 14, 1976, Ser. No. 687,403
Claims priority, application Japan, Dec. 26, 1975, 50-50903
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



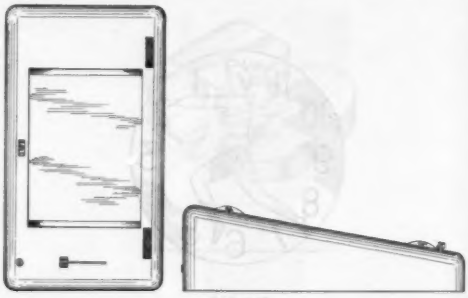
243,450
AERODYNAMIC DRAG REDUCTION DEVICE FOR VEHICLES
Paul B. MacCready, Jr., and Peter B. S. Lissaman, both of Pasadena, Calif., assignors to Aerovironment Inc., Pasadena, Calif.
Filed July 17, 1975, Ser. No. 596,658
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

243,451
MOVIE CAMERA
Shigeo Mizukawa, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Dec. 17, 1975, Ser. No. 641,475
Claims priority, application Japan, Aug. 13, 1975, 50-33246
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—04

243,452
COLOR MIXING HEAD FOR A PHOTOGRAPHIC ENLARGING APPARATUS
Mario Gandini, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy
Filed Oct. 8, 1975, Ser. No. 620,580
Claims priority, application Italy, Apr. 29, 1975, 6709/75
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—34

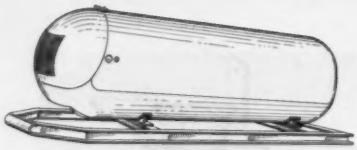


243,453
ILLUMINABLE CALENDAR HOLDER OR SIMILAR ARTICLE
Samuel J. Friedland, Flushing, N.Y., assignor to Collection Corporation, Flushing, N.Y.
Filed June 9, 1975, Ser. No. 584,906
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—20



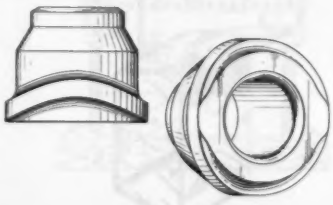
243,454
STORAGE TANK
Marvin D. Kerr, and Donald R. Kerr, both of 220 Burlington St., Hastings, Nebr. 68901
Filed Nov. 10, 1975, Ser. No. 630,140
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

243,455
CRYOGENIC LIQUID STORAGE VESSEL
Nicholas A. Verini, North Plainfield, N.J., assignor to Airco, Inc.
Filed Nov. 17, 1975, Ser. No. 632,430
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

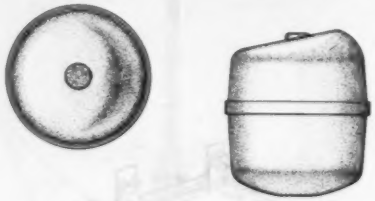


243,456
WELDING OUTLET
Bobby W. Ryan, Houston, Tex., assignor to WFI International, Inc.
Filed Feb. 20, 1976, Ser. No. 659,921
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

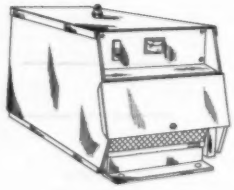
243,457
WELDING OUTLET
Bobby W. Ryan, Houston, Tex., assignor to WFI International, Inc.
Filed Feb. 20, 1976, Ser. No. 659,923
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



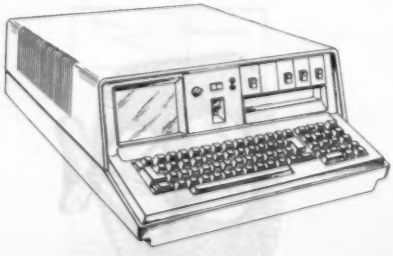
243,458
FILTER
David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.
Filed Mar. 18, 1976, Ser. No. 668,153
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



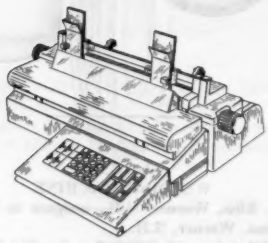
243,459
WELDING MACHINE
Theodore J. Bliss, Warner, N.H., assignor to Saban Electric Corporation, Warner, N.H.
Filed Apr. 10, 1975, Ser. No. 566,937
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—144



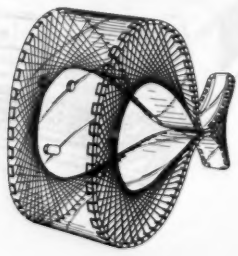
243,460
PORTABLE PERSONAL COMPUTER
John Greenfield; Collan B. Kneale, and Frank Wilkey, Jr., all of Rochester, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 7, 1975, Ser. No. 602,845
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45



243,461
DESK TOP ACCOUNTING MACHINE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Sept. 24, 1975, Ser. No. 616,376
Claims priority, application Italy, Mar. 27, 1975, 52989/75
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

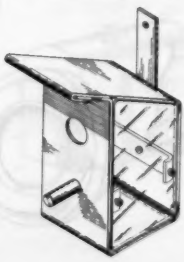


243,462
STRING FISH SCULPTURE
Margaret D. Sud, 2063 Golf Course Drive, Reston, Va. 22091
Filed June 9, 1975, Ser. No. 585,384
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

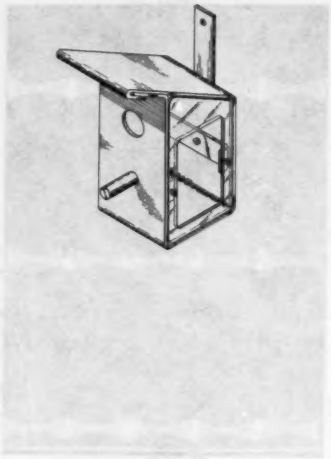


243,463
VASE OR SIMILAR ARTICLE
Frank J. Benes, and James Lloyd Thrush, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Filed July 11, 1974, Ser. No. 487,456
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—146

243,464
BIRD HOUSE
Michael L. Greene, 13103 Venango Road, Oxon Hill, Md. 20022
Filed July 9, 1975, Ser. No. 592,712
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—03



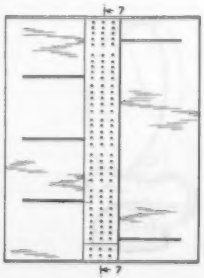
243,465
BIRD FEEDER
Michael L. Greene, 13103 Venango Road, Oxon Hill, Md. 20022
Filed July 9, 1975, Ser. No. 592,711
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



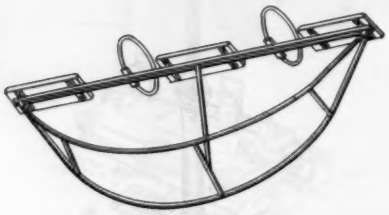
243,466
CEMETERY MEMORIAL MONUMENT
Christos J. Bentas, 129 Eleventh St., Lowell, Mass. 01850
Filed June 25, 1975, Ser. No. 590,070
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—17

243,467
TENNIS RACQUET FRAME
George Kouvelas, 181 Madison Ave., Englewood, N.J. 07631
Filed May 19, 1975, Ser. No. 578,621
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

243,468
GAME BOARD
Irving N. Levey, 4342 Britt Place, Columbus, Ohio 43227
Filed July 16, 1975, Ser. No. 596,450
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 TT

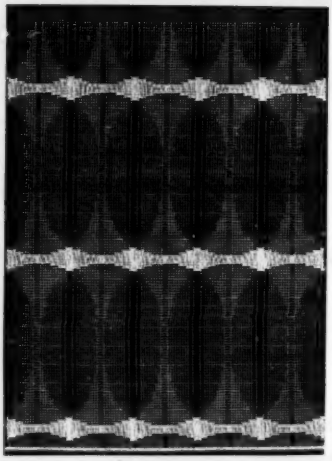


243,469
ROCKING TOY
William U. Nipper, Jr., Swainsboro, Ga., assignor to Randolph C. Karrh, Swainsboro, Ga.
Filed Mar. 15, 1976, Ser. No. 667,194
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 D

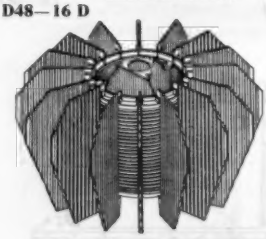


243,470
PENDANT
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed June 16, 1975, Ser. No. 586,995
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

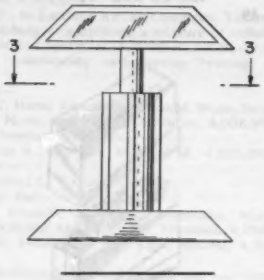
243,471
CURTAIN MATERIAL
Peter E. Schroeder, Am Falter 8, CH866 Lucerne, Switzerland
Filed Aug. 25, 1975, Ser. No. 607,838
Claims priority, application Germany, May 26, 1975, 360/75
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



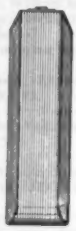
243,472
LAMP SHADE
Jhi Hung Leung, Kowloon, Hong Kong, assignor to Star Industrial Co., Ltd., Kowloon, Hong Kong
Filed Sept. 18, 1975, Ser. No. 614,601
Claims priority, application United Kingdom, Aug. 5, 1975, 972079/75
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



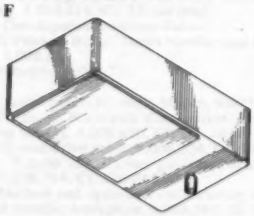
243,473
FLUORESCENT TABLE LAMP
Delores S. Freeman, 134-40 231st St., Laurelton, N.Y. 11413
Filed Feb. 18, 1976, Ser. No. 658,872
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



243,474
PORTABLE FLUORESCENT LANTERN
Chung Sum Leung, Kowloon, Hong Kong, assignor to Foster Industries Co., Ltd., Kowloon, Hong Kong
Filed July 8, 1975, Ser. No. 594,080
Claims priority, application United Kingdom, Feb. 13, 1975, 969865/75
Term of patent 7 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

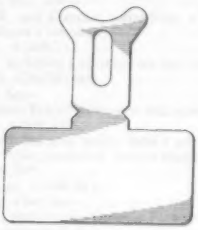


243,475
PHYSIOLOGICAL SENSOR FOR PLACEMENT ON THE SKIN ON HUMANS OR ANIMALS TO DETECT ELECTRICAL ACTIVITY IN THE LOCALIZED REGION THEREOF
Lawrence M. Frazier, 3432 Gauntlet, West Covina, Calif. 91792
Filed Nov. 20, 1974, Ser. No. 525,493
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 F



243,476
THERAPEUTIC ELECTRODE PAD
Roger E. Avery, 145 Rome St., Farmingdale, N.Y. 11735
Filed Apr. 24, 1975, Ser. No. 571,376
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 F

243,477
INTRAVENOUS TUBE ANCHOR
Jeffrey F. Cutruzzula, Pittsburgh, Pa., and Robert L. Schattner, Baltimore, Md., assignors to Omnimed, Inc., Burlington, N.J.
Filed Mar. 24, 1976, Ser. No. 670,206
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—52



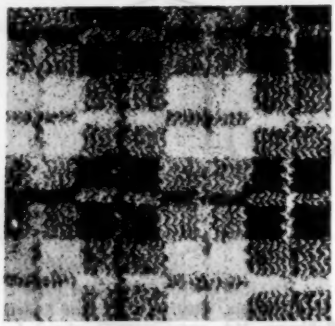
243,478
COMBINED MIRROR AND STAND THEREFOR
Ralph Godfrey Jones, Newtown Linford, England, assignor to Preci-Spark Limited, Syston, England
Filed Aug. 25, 1975, Ser. No. 607,573
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—65

243,479

TEXTILE PILE FABRIC

Peter R. Spirer, Coral Gables, Fla., assignor to Horizon Industries, Inc.

Filed Aug. 1, 1974, Ser. No. 493,832
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 AA

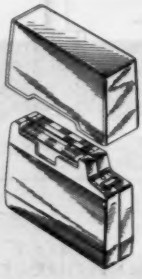


243,480

COMBINED ELECTRIC SHAVER AND COVER THEREFOR

Jacob A. Krapowicz, Ridgefield, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Feb. 24, 1975, Ser. No. 552,633
Term of patent 14 years
Int. Cl. C28—*03*
U.S. Cl. D28—49



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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Carbox: *See—*
Trolle, Sten, 4,008,659.

Abel, Edward P., to Eastman Kodak Company. Timing layer for color transfer assemblages comprising a mixture of cellulose acetate and maleic anhydride copolymer. 4,009,030, Cl. 96-29.00D.

Abel, Martin. Lubricating self-aligning bearing. 4,008,928, Cl. 308-72.000.

Abel, Paul: *See—*
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.

Abitibi Paper Company Ltd.: *See—*
Pozzo, James A.; and Yan, Maxwell M., 4,009,073.

Acura-Med: *See—*
Freitag, Samuel L., 4,008,802.

Adachi, Kiyoshi: *See—*
Numasaki, Kouichi; Ninomiya, Nobutaka; Matsumoto, Zenji; Adachi, Kiyoshi; and Fujimoto, Toyohisa, 4,008,994.

Adams, Jean M. Detachable gun sight mounts. 4,008,536, Cl. 42-1.00S.

Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, to American Cyanamid Company. Methods for controlling insects and acarina. 4,009,279, Cl. 424-277.000.

Agans, David J., to Massachusetts Institute of Technology. Frequency locked loop. 4,009,449, Cl. 331-16.000.

Agawa, Hiroshi: *See—*
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.

AGFA-Gevaert A.G.: *See—*
Becker, Manfred; and Ullrich, Roswitha, 4,009,036.
Beier, Siegfried, 4,009,383.
Deml, Reinhold; and Greis, Ulrich, 4,009,386.

Ainoya, Koh; Arai, Kiichi; Kato, Akira; and Tanaka, Michio, to Japan Tobacco & Salt Public Corporation, The; Neo Filter Co., Ltd.; and Sanjo Machine Works Ltd. Apparatus for piling rod-shaped articles in a container. 4,008,555, Cl. 53-148.000.

Air Products and Chemicals, Inc.: *See—*
Dixon, Dale D.; and Smith, William Mayo, Jr., 4,009,304.
Jensen, Bruce E.; and Tolar, Jimmie G., 4,009,048.

Aisin Seiki Kabushiki Kaisha: *See—*
Murakami, Noboru; and Hirosawa, Koichiro, 4,008,630.

Aizawa, Hiroshi: *See—*
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; and Uchidoi, Masanori, 4,009,480.

Akao, Masatake: *See—*
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; and Shibano, Takashi, 4,009,306.

Akashi, Goro: *See—*
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.

Akiba, Keiichiro: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.

Akita, Isao: *See—*
Okada, Hisao; Oyabe, Hideo; and Akita, Isao, 4,009,440.

Aktiebolaget Almex: *See—*
Lindholm, Ulf, 4,009,389.

Aktiengesellschaft "Weser": *See—*
Nitzki, Leopold; and Alsen, Jurgen, 4,008,674.

Aktieselskabet Grindstedvaerket: *See—*
Eliasson, Rune; and Nedenskov, Poul, 4,009,187.

Albers, Teo. Waste collection and conversion system. 4,008,689, Cl. 119-28.000.

Albertin, Andre: *See—*
Pommier, Claude; and Albertin, Andre, 4,009,410.

Albertson, Noel F., to Sterling Drug Inc. N-acylated-11-oxygenated-2,6-methano-3-benzazocine intermediates. 4,009,171, Cl. 260-293.540.

Alcaide, H. David; and Ewing, James H., to MKS Instruments, Inc. Vacuum monitoring. 4,008,619, Cl. 73-398.00C.

Alcan Research and Development Limited: *See—*
Fitzpatrick, Nigel Patrick; Byrne, James Neville; and MacDonald, Angus James, 4,008,884.
Sivilotti, Olivo Giuseppe, 4,008,750.

Alcolac Inc.: *See—*
Steckler, Robert; and Linder, Seymour Martin, 4,009,201.

Alexander, Charles F., Jr., to Brunswick Corporation. Pivotal mount assembly for trolling motors. 4,008,680, Cl. 115-18.00E.

Allen, Cloy L. Growth measuring scale. 4,008,524, Cl. 33-169.00R.

Allen, Joseph C., to Texaco Inc. Carrier gas vaporized solvent oil recovery method. 4,008,764, Cl. 166-266.000.

Allenspach, Walter. Method and apparatus for arcuately bending and rolling an elongated metallic workpiece. 4,008,595, Cl. 72-170.000.

Allewelt, Arthur L., to Rohm and Haas Company. Colored glass fiber articles and process. 4,009,314, Cl. 428-290.000.

Allgood, Tommy L. Fireplace heating system. 4,008,703, Cl. 126-121.000.

Allied Chemical Corporation: *See—*
Barrett, Joseph J.; and Buff, Ernest D., 4,008,961.

Allis-Chalmers Corporation: *See—*
Hanaway, Roger D., 4,008,819.
Hoepfl, Joseph R.; and Ballendux, Gerardus M., 4,008,629.

Alps Electric Co., Ltd.: *See—*
Kumagai, Tadashi; and Ogasawara, Shoji, 4,009,441.

Alsen, Jurgen: *See—*
Nitzki, Leopold; and Alsen, Jurgen, 4,008,674.

Alter, Seymour B.; and Turkenkopf, Eugene. Method and apparatus for forming expansible envelope. 4,008,650, Cl. 93-62.000.

Altermatt, Ruedi, to Sandoz Ltd. Mixtures of azo compounds having a 2-nitro-4-phenylsulfamoyldiphenyl amine nucleus. 4,009,158, Cl. 260-205.000.

Alza Corporation: *See—*
Theeuwes, Felix; and Ayer, Atul D., 4,008,719.

Amchem Products, Inc.: *See—*
Binns, Robert Eric, 4,009,115.
Starke, George Robert; and Cooke, Anson Richard, 4,009,020.

Ament, Roland W.; and Fender, Daniel C., to Wildlife Vaccines, Inc. Immersion method for treating aquatic animals. 4,009,259, Cl. 424-89.000.

American Cyanamid Company: *See—*
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 4,009,279.
Hoffman, Joseph Adrian, 4,009,207.
Walworth, Bryant Leonidas, 4,009,277.

American Gage & Manufacturing Co.: *See—*
Ross, Karl J., 4,008,881.

American Gas Association, Inc.: *See—*
Baker, Bernard S.; and Marianowski, Leonard G., 4,009,321.

American Standard, Inc.: *See—*
Fichter, Barry S.; and Duncan, Lane Scot, 4,008,732.

Amity Leather Products Company: *See—*
Lemler, Paul L., 4,008,742.

Amlong, William R., to Safety Laboratories, Inc. Gas dispensing assembly. 4,008,716, Cl. 128-203.000.

AMP Incorporated: *See—*
Gilissen, Hermanus Petrus Johannes; and van Dijk, Petrus Richardus Martinus, 4,008,519.
Kinkaid, Robert John; and Asick, John Carl, 4,008,939.
Redmond, John Peter; Andrews, Daniel Marshall; and Guyler, Karl Edward, 4,009,297.
Smith, Donald Lee, 4,008,941.

Anaconda Company, The: *See—*
Sauer, Philip D.; and Payne, Thomas F., 4,009,010.

Anderson-Cook, Incorporated: *See—*
Anderson, Marvin R.; and Jungesjo, Harald N., 4,008,702.

Anderson, Donald J.; Pisio, Peter; and Kirkvold, Charles F., to Chevron Research Company. Method of recovering viscous petroleum from thick tar sand. 4,008,765, Cl. 166-272.000.

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Anderson, Michael Denny, to Versapak (UK) Ltd. Sealing devices. 4,008,914, Cl. 292-307.00R.

Anderson, Olof Verner, to Anson Incorporated. Writing instrument top. 4,008,535, Cl. 40-334.000.

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Anderson, Philip C.: *See—*
Satterlee, Lowell Duggan; Arnold, Roy Gary; and Anderson, Philip C., 4,009,390.

Anderson, Richard C.; and Mathers, Marc G., to Varian Associates. Device providing sensible output indicating receipt of data by computer. 4,009,339, Cl. 178-18.000.

Andrews, Daniel Marshall: *See—*
Redmond, John Peter; Andrews, Daniel Marshall; and Guyler, Karl Edward, 4,009,297.

Andrews, Wendell C., to Corning Glass Works. Method of forming laminated curvilinear glass sheet. 4,009,064, Cl. 156-102.000.

Angelbauer, Ewald: *See—*
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.

Anhalt, John W.; Goodman, David S.; and Oliver, Leland W., to International Telephone and Telegraph Corporation. Electrical connector. 4,008,938, Cl. 339-17.0CF.

Anschutz & Co. GmbH: *See—*
Ehrich, Hans; Emshoff, Heiko; and Otto, Hans-Peter, 4,008,623.

Anson Incorporated: *See—*
Anderson, Olof Verner, 4,008,535.
Anderson, Olof Verner, 4,008,969.

Aoki, Kunio: *See—*
Yamada, Kouichi; Mizota, Tatsuo; Takeda, Kiyoshi; and Aoki, Kunio, 4,009,398.

Aonuma, Masashi: *See—*
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.

Appelbaum, Paul; and Rhodes, Cecil J., to Cartridge Vending Systems, Inc. Container for vending machines. 4,008,827, Cl. 221-197.000.

Applied Materials, Inc.: *See—*
Fisk, Robert Walter, 4,008,815.

Arai, Atsuaki; Ohi, Reiichi; Yamada, Minoru; Yokoo, Kenji; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 4,009,038, Cl. 96-100.000.

Arai, Kiichi: *See—*
Ainoya, Koh; Arai, Kiichi; Kato, Akira; and Tanaka, Michio, 4,008,555.

Arai, Tohru: *See—*
Komatsu, Noboru; Arai, Tohru; and Sugimoto, Yoshihiko, 4,009,086.

Arcilesi, Donald A.: *See—*
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,009,087.

Ardis, Alan E.; and Wojtowicz, John A., to Olin Corporation. Process for preparing 3-hydroxyoxetane. 4,009,182, Cl. 260-333.000.

Arizona Feeds: *See—*
Cardon, Bartley P.; and Frederick, Howard M., 4,009,268.

Armco Steel Corporation: *See—*
Maxel, John M., 4,009,225.

Armer Construction Company: *See—*
Hufford, Jerrold L., 4,008,756.

Arndt, O. Harold, to UOP Inc. Seat back adjuster. 4,008,920, Cl. 297-361.000.

Arney, William Charles; Williams, Clarence Alfred; and Glass, Joseph Edward, Jr., to Union Carbide Corporation. Bioresistant cellulose ethers. 4,009,329, Cl. 536-84.000.

Arnold, Roy Gary: *See—*
Satterlee, Lowell Duggan; Arnold, Roy Gary; and Anderson, Philip C., 4,009,390.

Arpe, Hans-Jurgen: *See—*
Leupold, Ernst Ingo; and Arpe, Hans-Jurgen, 4,009,209.

Asahi Glass Co., Ltd.: *See—*
Nagano, Kentaro; Henmi, Ichiro; and Kiyota, Masahiro, 4,008,843.

Asahi Optical Co., Ltd.: *See—*
Nobusawa, Tsukumo, 4,008,965.

Asano, Kiro: *See—*
Fujimaki, Hiroto; Kodama, Fumio; Takabe, Reiho; Asano, Kiro; and Seguchi, Koji, 4,009,305.

Ashley, Glen W., Jr.; Bucnting, Ernest O.; Leonard, Charles A.; and Lessman, Gerhard, to General Dynamics Corporation. Dual spectral range target tracking seeker. 4,009,393, Cl. 250-339.000.

Ashton, Harold P.: *See—*
Swett, James B.; and Ashton, Harold P., 4,008,526.

Asick, John Carl: *See—*
Kinkaid, Robert John; and Asick, John Carl, 4,008,939.

Asko, Inc.: *See—*
Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,598.
Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,970.

Athens Stove Works, Inc.: *See—*
Biddle, William P.; and Tacker, John J., 4,009,302.

Atlantic Richfield Company: *See—*
Lowe, Clovis Carroll, Jr., 4,008,763.
Moskovich, Peter P., 4,008,738.

Atlas Copco Aktiebolag: *See—*
Kallin, Karl Ake; Larcen, Jan August; and Meyer, Waldemar, 4,008,922.

Atlas Powder Company: *See—*
Bluhm, Harold F., 4,009,060.

Atsukawa, Masumi; Shinoda, Naoharu; and Inoue, Kenji, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for removing oxides of nitrogen and sulfur from exhaust gases. 4,009,244, Cl. 423-235.000.

Austin, Thomas H.: *See—*
Zimmerman, Robert L.; Austin, Thomas H.; and Schulze, Heinz, 4,009,130.

Automotive Products Company Limited: *See—*
Young, Alastair John, 4,008,925.

Ayalew, Liyew. Method of treatment of nematode parasite infections in domestic animals. 4,009,266, Cl. 424-177.000.

Ayer, Atul D.: *See—*
Theeuwes, Felix; and Ayer, Atul D., 4,008,719.

Aylon, Norman N., to General Concrete of Canada Limited. Control method for feeding items on a conveyor. 4,008,796, Cl. 198-460.000.

Ayres, Walter D., to Redco, Inc. Vacuum feed mechanism. 4,008,889, Cl. 271-99.000.

Babcock & Wilcox Company, The: *See—*
Kreider, Edward Wells; and Hoosic, Thomas Paul, 4,008,691.
Shimono, Nobuo; and Marubayashi, Hideki, 4,008,734.
Weatherford, Larry Green, Jr., 4,008,757.

Baber, Donald D., to Boise Cascade Corporation. Bidirectional tear strip means for cartons and the like. 4,008,849, Cl. 229-51.0TS.

Bach, John W.: *See—*
Hooper, Clinton; Miciukiewicz, Joseph F.; Pollak, Philip, Jr.; and Bach, John W., 4,008,660.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Paust, Joachim; and Schumacher, Horst, 4,009,202.
Poschmann, Franz; and Bergold, Wolfram, 4,009,119.

Badon, Kenneth E. Swimming pool play pen. 4,008,497, Cl. 4-171.000.

Baggiolini, Enrico; Confalone, Pasquale Nicholas; Pizzolato, Giacomo; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. 2,3,3a,6,7,7a-Hexahydro-thieno[3,2-b]pyridin-(4H)5-ones. 4,009,172, Cl. 260-293.550.

Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, to Bayer Aktiengesellschaft. Process of preparing substantially organic waste liquids containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage. 4,009,116, Cl. 252-301.10W.

Bailey, Morris W., to Overhead Door Corporation. Paneled door construction. 4,008,745, Cl. 160-229.00R.

Bajer, Francis J.: *See—*
Pawlak, Joseph A.; and Bajer, Francis J., 4,009,198.

Baker, Bernard S.; and Marianowski, Leonard G., to American Gas Association, Inc. High temperature fuel cell electrolyte. 4,009,321, Cl. 429-46.000.

Baker, Don R., to Stauffer Chemical Company. Bromoalkyl alkanesulfonate. 4,009,190, Cl. 260-456.00R.

Baker, Don R., to Stauffer Chemical Company. Bromoethyl diester of sulfoacetic acid. 4,009,191, Cl. 260-456.00R.

Bakos, Peter; and Rasile, John, to International Business Machines Corporation. High speed positive photoresist composition. 4,009,033, Cl. 96-33.000.

Balashova, Nadezhda Nikolaevna: *See—*
Sverchkov, Jury Sergeevich; Balashova, Nadezhda Nikolaevna; Popel, Viktor Mikhailovich; and Shmatok, Viktor Petrovich, 4,008,673.

Baldini, Giovanni, to Carrar & Matta S.p.A. Trolley with folding shelves. 4,008,671, Cl. 108-113.000.

Baldwin-Gegenheimer Corporation: *See—*
Stad, Andrew N., 4,008,516.

Ball Brothers Service Corporation: *See—*
Zappia, Anthony T., 4,008,525.

Ballendux, Gerardus M.: *See—*
Hoepfl, Joseph R.; and Ballendux, Gerardus M., 4,008,629.

Banas, Edmund Odon; and Schindel, Wesley Gerald. Preparation of CCl_3F and CCl_2F_2 from fluorspar and CCl_4. 4,009,215, Cl. 260-653.800.

Banks, Stewart: *See—*
Cooper, Howard Lee; and Banks, Stewart, 4,008,918.

Bar-on, Ari, to Xerox Corporation. Fuser assembly for an electrophotographic copying machine. 4,008,955, Cl. 355-3.00R.

Bardenheier, Josef: *See—*
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Barker, James Albert: *See—*
Mann, David Roderick; and Barker, James Albert, 4,009,037.

Barrett, Joseph J.; and Buff, Ernest D., to Allied Chemical Corporation. Monochromatic detection of plural rotational Raman spectra generated by multiple frequency excitation. 4,008,961, Cl. 356-75.000.

Barrett, William T., to Wehr Corporation. Conveyor belt wear protection. 4,008,799, Cl. 198-698.000.

Bartlett, Robert N. Removable fireplace heater. 4,008,707, Cl. 126-131.000.

Bartram, Ronald D.; and Runkle, Charles J., to Monsanto Company. Method for shaping a slit product. 4,008,597, Cl. 72-199.000.

Baserga, Emilio, to Sandoz Ltd. Basic anthraquinone dyes, their production and use. 4,009,189, Cl. 260-381.000.

BASF Aktiengesellschaft: *See—*
Fischer, Adolf, deceased; Hansen, Hanspeter; and Rohr, Wolfgang, 4,009,192.
Geierhaas, Herbert; Ripperger, Willi; and Herrmann, Walter, 4,009,125.
Hess, Klaus; Stickel, Richard; Nagel, Otto; Sinn, Richard; and Daucher, Hans, 4,009,100.
Laurer, Peter Rudolf; Schroeder, Wolfgang; Hoffmann, Herwig; and Lingk, Heinz, 4,009,124.
Schefczik, Ernst, 4,009,165.
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Bastle, Clifford F., to Singer Company, The. Solenoid valve. 4,008,876, Cl. 251-129.000.

Bauer, Lieselotte: *See—*
Krueger, Friedrich; and Bauer, Lieselotte, 4,009,204.

Baues, Peter; Mahlein, Hans; Reichelt, Achim; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Electro-optical switch and modulator. 4,008,947, Cl. 350-96.00C.

Baumayr, Hans E.: *See—*
Epstein, Arthur M.; and Baumayr, Hans E., 4,008,521.

Baumayr Instrument Co., Inc.: *See—*
Epstein, Arthur M.; and Baumayr, Hans E., 4,008,521.

Baumgartner, Hans Ulrich: *See—*
Wolf, Hans-Joachim; Meier, Franz; and Baumgartner, Hans Ulrich, 4,009,447.

Baus, Heinz Georg. Ventilating device. 4,008,652, Cl. 98-39.000.

Baxter Laboratories, Inc.: *See—*
Miller, Jimmy L.; Salkin, Burton; Schnell, William J.; and Wolf, Ludwig, Jr., 4,009,107.
Miller, Jimmy L.; Salkin, Burton; and Schnell, William J., 4,009,108.

Bayan, Aris P.: *See*—
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Bayer Aktiengesellschaft: *See*—
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Krocbel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,009,116.
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Bays, Marvin G., to Seiscom Delta Inc. Seismic signal source. 4,008,784, Cl. 181-114.000.
BBC Brown Boveri & Company Limited: *See*—
Bernasconi, Felix, 4,009,462.
Beard, Colin C., to Syntex (U.S.A.) Inc. Novel 2-substituted-1,2,4-thiadiazole-[2,3-a]-benzimidazoles and process for their preparation. 4,009,164, Cl. 260-250.0BN.
Bearcs, Allen George: *See*—
Lessig, William Ralph, III; and Bearcs, Allen George, 4,008,559.
Becker, Helmut: *See*—
Meyer, Frank; Becker, Helmut; and Goretz, Heinz, 4,008,576.
Becker, Manfred; and Ullrich, Roswitha, to AGFA-Gevaert A.G. Photographic developer. 4,009,036, Cl. 96-66.300.
Becker, Otto Alfred. Process and apparatus for welding sheet metal coated with layers. 4,009,362, Cl. 219-92.000.
Becker, Phillip D., to Buell Industries, Inc. Fastening device. 4,008,642, Cl. 85-35.000.
Becton, Dickinson and Company: *See*—
Johnson, Lavell R., 4,009,005.
Beermann, Paul; and Grosse-Bcnne, Wilhelm, to Hagenuk & Co. GmbH. Percussion igniter. 4,008,666, Cl. 102-70.00R.
Beetham, Stanley, to Clarke Chapman Limited. Orbital welding apparatus. 4,009,360, Cl. 219-60.00A.
Behrendt, George H.; and Potter, Jesse L., to Filteron Systems Inc. Marine sanitation method and device. 4,009,104, Cl. 210-62.000.
Beier, Siegfried, to AGFA-Gevaert A.G. Light chute arrangement. 4,009,383, Cl. 240-1.300.
Beiforte, Piero; and Perucca, Giovanni, to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA. Switching station for PCM telecommunication system. 4,009,349, Cl. 179-15.0AT.
Bell & Howell Company: *See*—
Hertel, Heinz E., 4,008,861.
Bell Telephone Laboratories, Incorporated: *See*—
Cutler, Cassius Chapin; and Limb, John Ormond, 4,009,330.
Ngo, Peter Dinh-Tuan, 4,009,415.
Sell, Darrell Dean, 4,009,385.
Bellocci, Rio; and Degois, Michel, to Pont-A-Mousson S.A. Method for low-pressure casting in a sand mould. 4,008,749, Cl. 164-66.000.
Belperin, Gerard, to Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T. Device for fixing a bearing on a concrete mass. 4,008,926, Cl. 308-3.00R.
Bendix Corporation, The: *See*—
Kluczynski, Matthew L.; and Orme, Myrl E., 4,008,737.
Bendler, Hellmut; Gawlick, Heinz; and Flach, Egon, to Dynamit Nobel Aktiengesellschaft. Device for tensioning safety belts in vehicles. 4,008,780, Cl. 180-82.00C.
Bennett, Harry Wrighton, to Rolls-Royce (1971) Limited. Gas turbine engine. 4,008,569, Cl. 60-39.51H.
Bennett, Ronald E., to General Electric Company. Attachment of heat pipes to electrical apparatus. 4,009,418, Cl. 361-38.000.
Bennett, Ronald E.: *See*—
Waldon, Paul L.; and Bennett, Ronald E., 4,009,417.
Bennion, Douglas N.; Hebbar, Ranna K.; and Deshpande, Sanjay L., to United States of America, Navy. Storage battery comprising positive electrode of a graphite and lithium fluoride compound. 4,009,323, Cl. 429-194.000.
Benson, William H.; and Rose, Gerald D. Resin-empotted dry-type electromagnet for dusty and gassey locations. 4,009,459, Cl. 335-300.000.
Bensoussan, Maurice: *See*—
Nguyen Dat, Nhiep; Bensoussan, Maurice; and Doucet, Bernard, 4,009,408.
Bentcler Werke AG: *See*—
Lachenmayer, Wilhelm, 4,009,066.
Berg, Alan, to United States of America, Navy. Aircraft steering and braking system. 4,008,868, Cl. 244-111.000.
Berg, David H.: *See*—
Boeck, LaVerne D.; and Berg, David H., 4,009,262.
Berger, Jean-Luc; and Woehrn, Daniel, to Thomson-CSF. Charge transfer image device. 4,009,333, Cl. 358-213.000.
Berger, Leo; and Corraz, Alfred John, to Hoffmann-La Roche Inc. Cyclopenta[b]indole-2-carboxylic acids and derivatives thereof. 4,009,181, Cl. 260-326.270.
Bergold, Wolfram: *See*—
Poschmann, Franz; and Bergold, Wolfram, 4,009,119.
Bergwerksverband GmbH: *See*—
Meyer, Frank; Becker, Helmut; and Goretz, Heinz, 4,008,576.
Berkowitz, Joseph; and Berkowitz, Minerva. Auto steering wheel lock protector. 4,008,590, Cl. 70-424.000.
Berkowitz, Minerva: *See*—
Berkowitz, Joseph; and Berkowitz, Minerva, 4,008,590.
Bernasconi, Felix, to BBC Brown Boveri & Company Limited. East actuating water resistor. 4,009,462, Cl. 338-80.000.
Bertino, Lorenzo: *See*—
Garberi, Sergio; and Bertino, Lorenzo, 4,008,795.
Bertram, Leo: *See*—
Schemmann, Hugo; and Bertram, Leo, 4,008,985.
Besancenot, Serge. Projector control mechanism. 4,008,953, Cl. 353-103.000.
Bettridge, David Frederick: *See*—
Cork, Frank; Bettridge, David Frederick; and Clarke, Philip Charles, 4,009,146.
Beyer, Arnold D.; and Tjon, Harry X., to Kaiser Aluminum & Chemical Corporation. Transfer mechanism. 4,009,050, Cl. 134-66.000.
Biddle, William P.; and Tacker, John J., to Athens Stove Works, Inc. Method of coating a gas range top burner. 4,009,302, Cl. 427-238.000.
Biebuyck, Lawrence F., to Howmet Corporation. Wall structure and elements therefor. 4,008,552, Cl. 52-397.000.
Binegar, Ernest W. Vehicle switch attachment. 4,009,363, Cl. 200-336.000.
Bingham, Sidney H.; and Eberhardt, William H. Cut and cover construction of subway with utility chamber and air conditioning with minimum street traffic disturbance. 4,008,577, Cl. 61-44.000.
Binns, Robert Eric, to Amchem Products, Inc. Composition and method for cleaning aluminum at low temperatures. 4,009,115, Cl. 252-142.000.
Bio-Industries, Inc.: *See*—
Hoge, William H., 4,009,075.
Birk, Silvia C., to Mobil Oil Corporation. Oil recovery by waterflooding employing multicomponent surfactant systems. 4,008,768, Cl. 166-274.000.
Blachere, Henri: *See*—
Moll, Manfred; Durand, Gilbert; and Blachere, Henri, 4,009,286.
Black Body Corporation: *See*—
Wells, Harold D., 4,008,996.
Black and Decker Manufacturing Company, The: *See*—
Lessig, William Ralph, III; and Bearcs, Allen George, 4,008,559.
Black, Philip William; and Irven, John, to International Standard Electric Corporation. Optical fiber manufacture. 4,009,014, Cl. 65-3.00A.
Blackwell, Henry Wayne, to Dresser Industries, Inc. Oil well tool with packing means. 4,008,759, Cl. 166-120.000.
Blanco, Francisco. Smoker's pipe construction. 4,008,725, Cl. 131-184.00A.
Bleckmann, Richard. Method of positive and non-positive cold-joining. 4,008,845, Cl. 228-136.000.
Bliss, Charles H.: *See*—
Nichols, Frank S.; Bliss, Charles H.; and Londergan, Robert J., 4,009,141.
Bluhm, Harold F., to Atlas Powder Company. Primer composition for use with explosive charges. 4,009,060, Cl. 149-93.000.
Blumenthal, Gunter; and Marr, Peter, to Bochumer Eisenhutte Heintzmann & Company. Pit prop assembly. 4,008,578, Cl. 61-45.00D.
Bober, Thomas W., to Eastman Kodak Company. Method for reclaiming extruded plastic resins. 4,009,235, Cl. 264-40.200.
Bochumer Eisenhutte Heintzmann & Company: *See*—
Blumenthal, Gunter; and Marr, Peter, 4,008,578.
Bocker, Richard P.; Bromley, Keith; Monahan, Michael A.; and Stotts, Larry B., to United States of America, Navy. Electro-optical system for performing matrix-vector multiplication. 4,009,380, Cl. 235-181.000.
Bockett-Pugh, Charles Paul, to Honeywell Inc. Bar display with scale markers. 4,009,414, Cl. 315-169.00R.
Bodenseewerk Perkin-Elmer & Co. GmbH: *See*—
Huber, Bernhard Werner; and Tamm, Rolf Gunther Arnold, 4,008,963.
Bodor, Nicolae S.; and Kaminski, James J., to Interx Research Corporation. Brominating and oxidizing agent and method of using same. 4,009,178, Cl. 260-307.00C.
Boeck, LaVerne D.; and Berg, David H., to Eli Lilly and Company. Antibiotic A-28086 recovery process. 4,009,262, Cl. 424-123.000.
Boehm, Arthur Flets: *See*—
Danilenko, Michael; Davis, James Robert, Jr.; and Boehm, Arthur Flets, 4,009,470.
Bohringer, Walter, to RCA Corporation. Voltage regulator for a deflection system. 4,009,426, Cl. 315-408.000.
Boise Cascade Corporation: *See*—
Baber, Donald D., 4,008,849.
Bom, Cornelis Johannes Gerardus: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,008,854.
Boney, William G.: *See*—
Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., 4,009,222.
Bonisch, Horst: *See*—
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.
Boone, James A.; Lewallen, Dennis L.; and Walker, Harold G., to Walker, Harold G., a part interest. Scraper assembly for ground tillage implement discs. 4,008,770, Cl. 172-566.000.
Boots Company Limited, The: *See*—
Cluzan, Robert; and Katz, Lazare, 4,009,174.
Borthwick, James; and Morman, James Forrester, to Imperial Chemical Industries Limited. Smoking mixture. 4,008,723, Cl. 131-2.000.

Borysiewicz, Richard; and Roedel, Charles W., to Milgo Electronic Corporation. Data modems having data drop-out and data echo protection. 4,009,356, Cl. 179-170.200.

Boscak, Vladimir G.: *See—*
Ostojic, Nedeljko; and Boscak, Vladimir G., 4,008,621.

Botsis, Nicolaos George; Korobilis, Panayotis Nicolas; Miras, Ioannis Constantin; and Eriparelis, George Michael, to Lamir Ltd. Tire failure indicator. 4,008,744, Cl. 152-427.000.

Boudreau, Paul Emile; and Moore, Brian Barry, to International Business Machines Corporation. Loop communications system with method and apparatus for switch to secondary loop. 4,009,469, Cl. 340-147.0SC.

Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Cooled integral valve chest for an internal combustion engine and method for making same. 4,008,695, Cl. 123-41.760.

Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Device for locating the position of the control rack of a pump and for locking the latter in disassembling position. 4,008,981, Cl. 417-63.000.

Bourboulis, Panagiotis. Building construction. 4,008,546, Cl. 52-65.000.

Boussageon, Pierre, to Societe Generale pour l'Emballage. High-frequency bonding apparatus. 4,009,068, Cl. 156-380.000.

Bowen, Max E. Method of forming tablets with separators of sheet material. 4,009,239, Cl. 264-112.000.

Boys, John T., to Standard Pressed Steel Co. Tightening system. 4,008,772, Cl. 173-12.000.

Boys, John T.: *See—*
Wallace, Paul W.; and Boys, John T., 4,008,773.

Bozzano, Stefano. Motorboat provided with power operated retractable wheels for landing on beaches. 4,008,679, Cl. 115-1.00A.

BP Chemicals International Limited: *See—*
Hunt, Thomas, 4,009,145.

Bradshaw, Kenneth; and Buckingham, James Ernest, to Cam Gears Limited. Rack and pinion units. 4,008,627, Cl. 74-498.000.

Braeger, Horst; and Groth, Gerhard, to Nordischer Maschinenbau Rud. Baader. Machine for filleting fish. 4,008,509, Cl. 17-56.000.

Branchaud, Jean-Marie. Newspaper vending machine. 4,008,828, Cl. 221-241.000.

Brandstatter, Hans G.: *See—*
Smellie, Allan M.; and Brandstatter, Hans G., 4,009,247.

Braun, Paul E.; and Sterner, Melvin F., to Ford Motor Company. Extended throttle bore multi-stage carburetor. 4,008,699, Cl. 123-122.0AB.

Breen, Barry C., to Tel-Tone Corporation. Multiple link circuit for a port multiplexer. 4,009,352, Cl. 179-18.0FF.

Brefka, Paul E.: *See—*
Turner, Robert Bruce; and Brefka, Paul E., 4,008,614.

Bremer, Robert Charles, Jr.; and Haupt, Hans Otto, to Wallace-Murray Corporation. Torsional vibration damper measuring. 4,008,600, Cl. 73-11.000.

Brinckmann, Paul; Krenz, Joachim-Ulrich; and Ruck, Werner. Blade with irrigation tubes. 4,008,720, Cl. 128-317.000.

Brix, Joachim Emil, to O & K Orenstein & Koppel Aktiengesellschaft. Water craft having sea opening with connecting conduit. 4,008,676, Cl. 114-151.000.

Brodbeck, Brunhilde. Massaging and relaxing device. 4,008,715, Cl. 128-57.000.

Bromley, Keith: *See—*
Bocker, Richard P.; Bromley, Keith; Monahan, Michael A.; and Stotts, Larry B., 4,009,380.

Brower, Jerrold J. Insulated fishing creel. 4,008,540, Cl. 43-55.000.

Brown, Boveri & Cie. A.G.: *See—*
Lob, Georg; and Pfohler, Clemens, 4,009,296.

Brown, Wayne Myron; and Manente, Joseph Carmen, Jr., to United Technologies Corporation. Compressor bleed system. 4,008,977, Cl. 415-1.000.

Brunkhorst, Robert: *See—*
Kilbourn, Lawrence Layton; and Brunkhorst, Robert, 4,008,532.

Brunswick Corporation: *See—*
Alexander, Charles F., Jr., 4,008,680.

Buanno, John M. Fireplace furnace. 4,008,706, Cl. 126-121.000.

Buckbee-Mears Company: *See—*
Woodfill, Ernest L., 4,009,422.

Buckingham, James Ernest: *See—*
Bradshaw, Kenneth; and Buckingham, James Ernest, 4,008,627.

Buckley, David A., to Xerox Corporation. Preparation of red amorphous selenium. 4,009,249, Cl. 423-510.000.

Budzik, Daniel A. Antitheft locking strap for clothing. 4,008,835, Cl. 223-85.000.

Buehl, Russell C.: *See—*
Cloran, Thomas S.; Thompson, Vernon R.; and Buehl, Russell C., 4,009,233.

Buell Industries, Inc.: *See—*
Becker, Phillip D., 4,008,642.

Buelow, Carol Ruth: *See—*
Megahed, El Sayed; Buelow, Carol Ruth; and Spellman, Patrick Joseph, 4,009,056.

Buenting, Ernest O.: *See—*
Ashley, Glen W., Jr.; Buenting, Ernest O.; Leonard, Charles A.; and Lessman, Gerhard, 4,009,393.

Buescher, William E.; and Kerstetter, Donald R., to GTE Sylvania Incorporated. Fast warmup cathode and method of making same. 4,009,409, Cl. 313-337.000.

Buff, Ernest D.: *See—*
Barrett, Joseph J.; and Buff, Ernest D., 4,008,961.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,008,999.

Buhler, Hermann, to Ciba-Geigy Corporation. Process for the dyeing or printing and simultaneous finishing of cellulose materials. 4,009,000, Cl. 8-17.000.

Burke, Noel I., to Tee-Pak, Inc. Method for improving the filterability of aluminum salts precipitated from aqueous solutions. 4,009,103, Cl. 210-51.000.

Burlington Industries, Inc.: *See—*
Reid, James P., Jr.; and McConnell, Bobby L., 4,009,001.

Burns, Joseph R., to RCA Corporation. Charge coupled memory system. 4,009,473, Cl. 340-173.00R.

Burrell Industrial Supply Company: *See—*
Zeloyle, Daniel J., 4,008,935.

Burroughs Corporation: *See—*
Lacher, William Arthur, 4,009,437.
Simon, Paul W., 4,009,061.

Burroughs Wellcome, Inc.: *See—*
Thomas, Derek; and Zola, Heddy, 4,009,257.

Burton, Charles V., to Medtronic, Inc. Tape electrode for transmitting electrical signals through the skin. 4,008,721, Cl. 128-418.000.

Buys, Henri, to Transac-Compagnie pour le Development des Transactions. Distributor of sheets in wads. 4,008,891, Cl. 271-263.000.

Byrne, James Neville: *See—*
Fitzpatrick, Nigel Patrick; Byrne, James Neville; and MacDonald, Angus James, 4,008,884.

Cabet, Alain; Pinier, Gaston; Semur, Pierre; and Roy, Marie-Annick, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Level regulator of the digital type. 4,009,350, Cl. 179-15.0BP.

Cade, Richard Lukens: *See—*
Sigwarth, Herbert Francis; and Cade, Richard Lukens, 4,008,917.

Cahoy, Roger P., to Gulf Oil Corporation. Process for manufacturing 3,5-ditert.butyl-4-hydroxybenzaldehyde by formylation of 2,6-ditert-.butylphenol. 4,009,210, Cl. 260-600.00R.

Calcagno, Piero; Garetti, Enzo; and Lobisch, Gunter, to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA. Logic network for programmable data concentrator. 4,009,468, Cl. 340-147.00C.

Cam Gears Limited: *See—*
Bradshaw, Kenneth; and Buckingham, James Ernest, 4,008,627.

Cameron Iron Works, Inc.: *See—*
Weldon, James M., 4,008,898.

Campbell, Stephen: *See—*
Coulter, Wallace H.; Hogg, Walter R.; Longman, Millard D., Jr.; Campbell, Stephen; and Doty, Edward Neal, 4,009,443.

Canadian Patents and Development Limited: *See—*
Warkentin, John; Ramakrishnan, Kottieth; Jain, Rup C.; and Wandelmaier, Frank W., 4,009,276.

Canavan, Joseph M., to Raymond Lee Organization, Inc., The, a part interest. Support for elongated wooden planks and the like. 4,008,786, Cl. 182-186.000.

Canon Kabushiki Kaisha: *See—*
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; and Uchidoi, Masanori, 4,009,480.
Nagaoka, Tateki; Kimura, Yoshimasa; and Komiya, Yutaka, 4,008,612.

Caprara, Giuseppe: *See—*
Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, 4,009,183.

Cardinne, Philippe; Colomb, Francois; Manhes, Bernard; Nordman, James Emery; and Serve, Raymond, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Josephson junction. 4,009,479, Cl. 357-5.000.

Cardon, Bartley P.; and Frederick, Howard M., to Arizona Feeds. Composition and method for reducing the incidence of scours in neo-natal ruminants. 4,009,268, Cl. 424-180.000.

Carl Still, Firma: *See—*
Weber, Heinrich; Choulat, Gustav; and Laufhutte, Dieter, 4,009,243.

Carlson, David P.; Keenan, Thomas R.; and Marks, Douglas L., to Polaroid Corporation. Diffusion transfer image-receiving element having polyvinylpyridine layer treated with hydrophilic colloid/ammonia solution. 4,009,031, Cl. 96-29.00D.

Carmack, Larry G.: *See—*
Roach, Maurice P.; Schoenjahn, Ann E.; and Carmack, Larry G., 4,008,604.

Carosella, John H.: *See—*
Hayosh, Thomas D.; and Carosella, John H., 4,009,369.

Carrar & Matta S.p.A.: *See—*
Baldini, Giovanni, 4,008,671.

Carree, Francis, to Societe Jeantil & Cie. Planting machine for potatoes and other tubers. 4,008,826, Cl. 221-13.000.

Carroll, William Michael, to Koller Die & Tool Company. Non-rotatable flame guard assembly. 4,008,822, Cl. 220-94.00R.

Carson, Don B., to UOP Inc. Mixed-phase fluid distribution for packed chambers. 4,009,095, Cl. 208-108.000.

Carter, Cecil O., to Phillips Petroleum Company. HF recovery with alkyl fluoride formation and utility in alkylation. 4,009,221, Cl. 260-683.480.

Carter, H. Kennon; and Mlekodaj, Ronald L., to United States of America, Energy Research and Development Administration. Seal for permitting transfer of tape from one pressure region to a region of substantially different pressure. 4,008,899, Cl. 277-135.000.

Carter, William, to United Merchants and Manufacturers, Inc. Process for treating textile fabric to retard inflammability. 4,009,002, Cl. 8-116.00P.

Cartridge Vending Systems, Inc.: *See—*
Appelbaum, Paul; and Rhodes, Cecil J., 4,008,827.
Cascade Corporation: *See—*
Farmer, Stanley E.; Faust, Donald M.; and Weinert, Harry F., 4,008,648.
Olson, John E.; and Seaberg, Richard D., 4,008,875.
Shafii-Kahany, Hooshang; and McCart, Larry D., 4,008,791.
Casciato, Leonard: *See—*
White, Howard S.; and Casciato, Leonard, 4,009,375.
Caterpillar Mitsubishi Ltd.: *See—*
Tomio, Uchida, 4,008,771.
Caterpillar Tractor Co.: *See—*
Clarke, John Michael; and Gilchrist, David Stuart, 4,008,989.
Gibson, Myron R., 4,008,986.
Ritchie, James A., 4,008,987.
Caulfield, Richard A. Drawing apparatus. 4,008,528, Cl. 35-26.000.
Cavanagh, Joseph C., to Midland Glass Company, Inc. Method of curing plastic coatings on bottles. 4,009,298, Cl. 427-55.000.
Cavendish, Michael Edward; and Elloy, Martin Arthur, to National Research Development Corporation. Prosthetic bone joint devices. 4,008,495, Cl. 3-1.910.
Celanese Corporation: *See—*
Stautzenberger, Adin Lee; and Paul, James Leonard, 4,009,003.
Center, Warren A. Gun. 4,008,538, Cl. 42-78.000.
Chaffin, John H., III, to Honeywell Inc. Preparation of graded composition protective coatings. 4,009,300, Cl. 427-162.000.
Champan, Louis W., to Melco. Signalling device for key telephone systems. 4,009,354, Cl. 179-99.000.
Chanal, Roger, to Etat Francais represente par le Delegue Ministeriel pour l'Armement. Return device for steering mechanism. 4,008,782, Cl. 180-132.000.
Chandra, Rangasami Sarat; and Stone, Kirby Lee, to Cincinnati Milacron, Inc. Ratio controlled mixing of liquids. 4,008,829, Cl. 222-63.000.
Chang, Harry L., to Mobil Oil Corporation. Oil recovery by microemulsion injection. 4,008,769, Cl. 166-274.000.
Chapman, Richard A.; Jasinski, Raymond J.; and Manns, William G., to Texas Instruments Incorporated. Electrochromic display cell structure. 4,008,950, Cl. 350-160.00R.
Charney, William: *See—*
Ilavsky, Jan; Bayan, Aris P.; Charney, William; and Reimann, Hans, 4,009,269.
Charron, Louis Donald: *See—*
Dalgleish, Jack Frank; Lukas, Helmut Hans; and Charron, Louis Donald, 4,008,948.
Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., to Owens-Corning Fiberglas Corporation. Glass fiber coated with a size comprising emulsified clad particles of poly(methyl methacrylate). 4,009,317, Cl. 428-378.000.
Chase, Peter McGivery: *See—*
Debortoli, George; and Chase, Peter McGivery, 4,009,340.
Chemetal Corporation: *See—*
Holzl, Robert A., 4,008,976.
Chemetron Corporation: *See—*
Tallmadge, Gene E.; and Gerling, John E., 4,009,359.
Chemische Werke Huls Aktiengesellschaft: *See—*
List, Ferdinand; and Wember, Kurt, 4,009,199.
Chermack, Robert W. Dispensing apparatus for filling drinking containers. 4,008,740, Cl. 141-100.000.
Chevron Research Company: *See—*
Anderson, Donald J.; Pisio, Peter; and Kirkvold, Charles F., 4,008,765.
Chien, James C. W.; and Schappell, Frederick George, to Hercules Incorporated. Process of preparing fire-retardant natural and synthetic fibers. 4,009,294, Cl. 427-35.000.
Chizinsky, George. Solvent article cleaner. 4,008,729, Cl. 134-107.000.
Chmiel, Horst. Blood pump. 4,008,710, Cl. 128-1.00D.
Choulat, Gustav: *See—*
Weber, Heinrich; Choulat, Gustav; and Laufhutte, Dieter, 4,009,243.
Christensson, Od Wikar, to Esseltepac Aktiebolag. Cup formed container having a lining foil. 4,008,848, Cl. 229-31.00R.
Christofer, Donald E.: *See—*
Stock, Arthur J.; and Christofer, Donald E., 4,008,658.
Christopher, Edward Charles: *See—*
Nebelung, Hermann; and Christopher, Edward Charles, 4,009,018.
Chubb, Talbot A. Intermittent energy input salt bath chemical processor. 4,008,758, Cl. 165-94.000.
Cianciotti, Nicholas, to Queen Casuals, Inc. Work guiding and trimming apparatus for sewing machines. 4,008,672, Cl. 112-121.120.
Ciba-Geigy AG: *See—*
Ezekiel, Aaron David, 4,009,176.
Ciba-Geigy Corporation: *See—*
Buhler, Hermann, 4,009,000.
Topfl, Rosemarie; and Von Rutte, Richard, 4,009,110.
Ciccarello, Richard L. Device for spinning of metal objects. 4,008,593, Cl. 72-75.000.
Cincinnati Milacron-Heald Corporation: *See—*
Hahn, Robert S.; Holmstrom, Bruno A.; St. Andre, Arthur F.; and Youden, David H., 4,008,631.
Cincinnati Milacron, Inc.: *See—*
Chandra, Rangasami Sarat; and Stone, Kirby Lee, 4,008,829.
Cinelli, Ermanno: *See—*
Paret, Giancarlo; and Cinelli, Ermanno, 4,009,084.
Clark, Harold E., to Xerox Corporation. Character coding and recognition system. 4,009,466, Cl. 340-146.30B.
Clark, Lowell E., to Motorola, Inc. Implementation of surface sensitive semiconductor devices. 4,009,483, Cl. 357-52.000.
Clarke Chapman Limited: *See—*
Beetham, Stanley, 4,009,360.
Clarke, John Michael; and Gilchrist, David Stuart, to Caterpillar Tractor Co. Bolt seal for rotary piston machine. 4,008,989, Cl. 418-120.000.
Clarke, Kenneth, to Imperial Chemical Industries Limited. Containers for packaging liquids. 4,009,287, Cl. 426-106.000.
Clarke, Philip Charles: *See—*
Cork, Frank; Bettridge, David Frederick; and Clarke, Philip Charles, 4,009,146.
Clauss, Karl: *See—*
Pietsch, Hartmut; Clauss, Karl; Schmidt, Erwin; and Jensen, Harald, 4,009,161.
Clemmons, Quentin T., to Westinghouse Air Brake Company. Multibrake shoe means for a multi-braking surface braked assembly. 4,008,789, Cl. 188-70.00R.
Cline, Warren K., to Olin Corporation. Regenerated cellulose film, aluminum foil laminates and method for producing same. 4,009,319, Cl. 428-424.000.
Cloran, Thomas S.; Thompson, Vernon R.; and Buehl, Russell C., to Crucible Inc. Method for producing alloy particles. 4,009,233, Cl. 264-10.000.
Clowers, Earl R., to Singer Company, The. Above-the-floor adaptor for upright vacuum cleaners. 4,008,505, Cl. 15-338.000.
Cluett, Peabody & Co., Inc.: *See—*
Crawford, Douglas J.; LeMere, Roger; and Hughes, Francis H., 4,008,637.
Cluzan, Robert; and Katz, Lazare, to Boots Company Limited, The. Esters of substituted nicotinic acids. 4,009,174, Cl. 260-293.690.
Coca-Cola Co., The: *See—*
Rodth, Joseph John, 4,008,832.
Cochran, Steven Maitland: *See—*
Wilson, Robert Burr; and Cochran, Steven Maitland, 4,008,842.
Cofer, Larry Wilson: *See—*
Wegscheid, Edmund Lawrence; and Cofer, Larry Wilson, 4,008,556.
Cole, Edward L.; and Nolan, John T., Jr., to Texaco Inc. Stabilizing pyrolysis naphtha. 4,009,094, Cl. 208-48.0AA.
Cole, Lorin Charles. Tool for making whip finishing knot. 4,008,913, Cl. 289-17.000.
Colgate-Palmolive Company: *See—*
Renold, Adolph, 4,009,254.
Yurko, Joseph A., 4,009,114.
Colomb, Francois: *See—*
Cardinne, Philippe; Colomb, Francois; Manhes, Bernard; Nordman, James Emery; and Serve, Raymond, 4,009,479.
Combined Services, Incorporated: *See—*
Parsons, James C., 4,008,959.
Compagnie Industrielle des Piles Electriques "Cipel": *See—*
Gerbier, Gerard, 4,009,320.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Cabet, Alain; Pinier, Gaston; Semur, Pierre; and Roy, Marie-Annick, 4,009,350.
Lemoussu, Michel, 4,009,341.
Conair Corporation: *See—*
Rizzuto, L. P., 4,009,367.
Confalone, Pasquale Nicholas: *See—*
Baggiolini, Enrico; Confalone, Pasquale Nicholas; Pizzolato, Giacomo; and Uskokovic, Milan Radoje, 4,009,172.
Conn, John L. Triple skate attachments. 4,008,901, Cl. 280-7.130.
Connely, Tim R.: *See—*
Yen, David H.; Connely, Tim R.; and Lee, John J., 4,008,617.
Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 7-Substituted triol derivatives of acid S, an antibiotic produced by *polyangium cellulosum* var. *fulvum*. 4,009,261, Cl. 424-121.000.
Construction Mills-K: *See—*
Goussard, Alain, 4,008,668.
Continental Can Company, Inc.: *See—*
Erlandson, Paul M.; and Szatkowski, Richard R., 4,009,234.
Thompson, George W.; and Hilgenbrink, John T., 4,008,821.
Continental Group, Inc., The: *See—*
Khoury, Nick S., 4,008,825.
Continental Oil Company: *See—*
Lindberg, Carl E., 4,008,972.
Reynolds, Edward B., 4,008,608.
Continental Scale Corporation: *See—*
Kushmuk, Walter P., 4,008,776.
Conway, John W., Jr. Umbrella supporting bracket for motorized carts. 4,008,874, Cl. 248-534.000.
Cook Electric Company: *See—*
Splitt, Frank G.; and Scheithauer, Eric A., 4,009,421.
Cooke, Anson Richard: *See—*
Starke, George Robert; and Cooke, Anson Richard, 4,009,020.
Cooper, Dean Earl; and Klingloff, Robert Fuller, to United Technologies Corporation. Control for helicopter having dual rigid rotors. 4,008,979, Cl. 416-40.000.
Cooper Howard Lee; and Banks, Stewart, to Products for Proud Parents Limited. Chairs. 4,008,918, Cl. 297-16.000.
Cork, Frank; Bettridge, David Frederick; and Clarke, Philip Charles, to Rolls-Royce (1971) Limited. Method of and mixture for aluminizing a metal surface. 4,009,146, Cl. 260-42.220.

Corning Glass Works: *See—*
Andrews, Wendell C., 4,009,064.
Elmer, Thomas H.; Hillman, Arthur E.; Hoekstra, Karl E.; Howell, Robert G.; Rauscher, Herbert E.; and Smith, Charles C., Jr., 4,009,318.
Rittler, Hermann L., 4,009,042.

Corraz, Alfred John: *See—*
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Correll, Richard R. Ladder rack. 4,008,838, Cl. 224-42.10F.

Cosden Technology, Inc.: *See—*
Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 4,009,140.

Coulter Electronics, Inc.: *See—*
Coulter, Wallace H.; Hogg, Walter R.; Longman, Millard D., Jr.; Campbell, Stephen; and Doty, Edward Neal, 4,009,443.
Hogg, Walter R., 4,009,435.

Coulter, Wallace H.; Hogg, Walter R.; Longman, Millard D., Jr.; Campbell, Stephen; and Doty, Edward Neal, to Coulter Electronics, Inc. Method and apparatus for providing primary coincidence correction during particle analysis utilizing time generation techniques. 4,009,443, Cl. 328-111.000.

Courant, Jacques; Gonnet, Robert; and Thore, Marc, to Zenith Aviation. Filling valves for pressure fueling devices. 4,008,733, Cl. 137-220.000.

CPC International Inc.: *See—*
Walon, Raoul Guillaume Philippe, 4,009,074.

Crane, Herbert R.; and Fullenkamp, Anthony L., to Hobart Corporation. Meat gripping and moving cylinder and mount therefor. 4,008,502, Cl. 15-3.170.

Crawford, Douglas J.; LeMere, Roger; and Hughes, Francis H., to Cluett, Peabody & Co., Inc. Apparatus for cutting hemmed fabric pieces. 4,008,637, Cl. 83-155.000.

Crawford, George H.; Nawrot, Charles F.; and Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Enzymatically dispersible non-woven webs. 4,009,313, Cl. 428-290.000.

Crepeau, Melvin J.: *See—*
LaPine, Robert L.; and Crepeau, Melvin J., 4,008,508.

Crissman, James H.; and Fritsche, G. Ray, to Gulf Research & Development Company. Filtering process. 4,009,089, Cl. 204-188.000.

Crossley, Roger: *See—*
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Crucible Inc.: *See—*
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Morelli, Robert T., 4,009,025.

Crum, James N.; and Treff, Ernest H., to Harris-Intertype Corporation. Ink key control system. 4,008,664, Cl. 101-365.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni SpA: *See—*
Belforte, Piero; and Perucca, Giovanni, 4,009,349.
Calcagno, Piero; Garetti, Enzo; and Lobisch, Gunter, 4,009,468.

CTEC Corporation: *See—*
Herrmann, Hans H.; and Herrmann, Karl H., 4,008,783.

Cummins Engine Company, Inc.: *See—*
Woollenweber, William E., Jr., 4,008,572.

Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, to John Wyeth & Brother Limited. 8-Carboxylester, and 8-carbamyl derivitives of 5,6,7,8-tetrahydroquinoline. 4,009,169, Cl. 260-287.00T.

Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. Certain 3-pyridinecarbonitriles, derivatives thereof and anti-ulcer compositions containing same. 4,009,274, Cl. 424-263.000.

Curt G. Joa, Inc.: *See—*
Hirsch, John L., 4,008,851.

Cutler, Cassius Chapin; and Limb, John Ormond, to Bell Telephone Laboratories, Incorporated. Circuit for selecting frames indicative of still pictures. 4,009,330, Cl. 358-83.000.

Cutler, Earl F., to Cutler Repaving Associates Incorporated. Apparatus for conveying asphalt concrete mixtures. 4,008,975, Cl. 404-101.000.

Cutler Repaving Associates Incorporated: *See—*
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Cutler, Royal A.; and Schalit, Samuel, to Sterling Drug Inc. Amidinoureas and amidinothioureas. 4,009,163, Cl. 260-247.20A.

Cutter, James W., to NSC International Corporation. Electrically actuated punching and binding apparatus. 4,008,501, Cl. 11-1.0AC.

Czauderna, Norbert; Fenske, Gunther; Klimek, Karl-Heinz; Lubina, Siegfried; Malinowski, Fritz; and Schonrock, Bernhard, to Ruhrkohle AG. Automatic excavating machine and method of operating the same. 4,008,921, Cl. 299-1.000.

Dai Nippon Printing Company Limited: *See—*
Shikaya, Yukihiro, 4,008,649.

Dajani, Esam Z.: *See—*
De Benneville, Peter L.; Moss, Jack N.; and Dajani, Esam Z., 4,009,284.

Dalgleish, Jack Frank; Lukas, Helmut Hans; and Charron, Louis Donald, to Northern Telecom Limited. Optical fibre connectors. 4,008,948, Cl. 350-96.00C.

Danell, Russell D., to James B. Carter Limited. Thermal pulse type heater and valve therefore. 4,009,366, Cl. 219-208.000.

Danilenko, Michael; Davis, James Robert, Jr.; and Boehm, Arthur Flets, to Sperry Rand Corporation. Pre-emptive, rotational priority system. 4,009,470, Cl. 340-172.500.

Dansk Industri Syndikat A/S: *See—*
Gunnergaard, Marius, 4,008,748.

Dany, Franz-Josef; Wortmann, Joachim; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Intumescent flame-retardant coating compositions. 4,009,137, Cl. 260-29.6MP.

Darrow, John O. G., to Westinghouse Air Brake Company. Low gain pulse generating circuit. 4,009,403, Cl. 307-268.000.

Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe constant amplitude signal generator. 4,009,454, Cl. 331-117.00R.

Dart Industries Inc.: *See—*
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Dattilo, Donald J., to Motorola, Inc. Two piece sheet metal capstan housing assembly. 4,008,841, Cl. 226-194.000.

Daucher, Hans: *See—*
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Davies, David Huw: *See—*
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Davies Magnet Works Limited: *See—*
Davies, Philip Morey, 4,008,904.

Davies, Philip Morey, to Davies Magnet Works Limited. Fifth wheel coupling. 4,008,904, Cl. 280-435.000.

Davis, Charles S.: *See—*
Schwan, Thomas J.; Davis, Charles S.; and Honkomp, LeRoy J., 4,009,177.

Davis, Elmer O. Apertured mailing card and method of using. 4,008,852, Cl. 229-92.300.

Davis, James Robert, Jr.: *See—*
Danilenko, Michael; Davis, James Robert, Jr.; and Boehm, Arthur Flets, 4,009,470.

Davis, John C. Shipping container. 4,008,847, Cl. 229-14.00C.

Davis, Lewis Kie, to Deere & Company. Swingable shield assembly for tractor power take-off. 4,008,583, Cl. 64-32.00R.

Davis, Stephen H., to Water Refining Company, Inc. Containerized water refiner exchange system. 4,009,102, Cl. 210-33.000.

Dayton-Walther Corporation: *See—*
Walther, William D.; and DeRegnaucourt, Robert A., 4,008,923.

De Benneville, Peter L.; Moss, Jack N.; and Dajani, Esam Z., to Rohm and Haas Company. Gastrointestinally active thioureas. 4,009,284, Cl. 424-322.000.

Debortoli, George; and Chase, Peter McGivery, to Northern Electric Company Limited. Loading coil assemblies for communications cables. 4,009,340, Cl. 178-46.000.

de Brebisson, Michel; Monfret, Alain Gerard; and Decrouen, Jean-Michel, to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,009,057, Cl. 148-1.500.

Decker, Herbert, to Triumph Werke Nurnberg A.G. Type carrier print deflection blocking means for a single-element printer. 4,008,794, Cl. 197-55.000.

Decombe, Robert: *See—*
Serex, Charles; Hugelin, Bernard; and Decombe, Robert, 4,008,998.

DeCoursey, Leonard T. Method and apparatus for treating tobacco. 4,008,724, Cl. 131-133.00A.

Decrouen, Jean-Michel: *See—*
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Deere & Company: *See—*
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Mott, Roger Eugene, 4,008,558.
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Schafer, Richard Arthur; and Vaughn, Bennie Joe, 4,008,906.
Schulte, Gary Lee; and Whisler, Edwin Lee, 4,008,626.
Sigwarth, Herbert Francis; and Cade, Richard Lukens, 4,008,917.
Soteropulos, Gust; and Vogt, James Lee, 4,008,905.
Wegscheid, Edmund Lawrence; and Cofer, Larry Wilson, 4,008,556.

DeFreitas, Richard E., to Hybrid Systems Corporation. Delta-sigma converter and decoder. 4,009,475, Cl. 340-347.0AD.

Degeest, Joseph Theo: *See—*
Vandewijer, Romain Gustave Edgard; and Degeest, Joseph Theo, 4,009,046.

Degois, Michel: *See—*
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De Koning, Joseph G.; Goldwasser, Robert E.; and Hamilton, Robert J., Jr., to Varian Associates. Dual diode microwave amplifier. 4,009,446, Cl. 330-34.000.

Deml, Reinhold; and Greis, Ulrich, to AGFA-Gevaert A.G. Method and arrangement for automatically focussing an objective onto a subject, using autocollimation. 4,009,386, Cl. 250-201.000.

DeMoss, Edward E., to Teledyne, Inc. Circulating valve. 4,008,760, Cl. 166-321.000.

Dempsey, Martin J.: *See—*
Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,598.
Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,970.

Denney, Joe W., to Moorhouse, Walter. Watch band link connecting device. 4,008,632, Cl. 81-3.00R.

de Paez, Consuelo R.; and Paez, Stephen A., to de Paez, Consuelo R. Sorter for yarn-like materials. 4,008,806, Cl. 209-122.000.

DeRegnaucourt, Robert A.: *See—*
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Derenbecher, William Joseph, Jr., to RCA Corporation. Blanking generator for PAL sync signals. 4,009,487, Cl. 358-19.000.

Desai, Arvind C.: *See—*
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Deshpande, Sanjay L.: *See—*
Bennion, Douglas N.; Hebbar, Ranna K.; and Deshpande, Sanjay L., 4,009,323.

Deubel, Reinhold; Grossmann, Max; Hemmerling, Volker; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Sulfonsuccinic acid semiesters, process for their preparation and their use in pigment preparations for aqueous flexo printing pastes. 4,009,142, Cl. 260-38.000.

Deucker, Walter; Spietschka, Ernst; and Steidl, Dieter, to Hoechst Aktiengesellschaft. Continuous process for preparing copper phthalocyanine. 4,009,180, Cl. 260-314.500.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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vonBebenburg, Walter; and Offermanns, Heribert, 4,009,271.

Devers, Melvin W.; and Felske, William L., to General Motors Corporation. Method for locating insert in cast iron. 4,008,747, Cl. 164-9.000.

Devis, Michel. Wire tightener. 4,008,880, Cl. 254-161.000.

Diagnostic Data, Inc.: *See—*
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Diamond, Martin J.: *See—*
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Freedman, Bernard; and Diamond, Martin J., 4,009,325.

Diana, Guy D., to Sterling Drug Inc. 1-Ethoxy-3,4-dihydroisoquindines. 4,009,170, Cl. 260-289.00R.

Dias, Francesco: *See—*
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Diessel, Paul: *See—*
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DiGiuseppe, Domenico M. Tri-comb waver. 4,008,726, Cl. 132-9.000.

Dill, Terry A., to Fairfield Engineering and Manufacturing Company. Stock trailer. 4,008,902, Cl. 280-43.230.

Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, to RCA Corporation. Constant current supply. 4,009,432, Cl. 323-4.000.

Display Corporation International: *See—*
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Distler, Dieter: *See—*
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Dixon, Dale D.; and Smith, William Mayo, Jr., to Air Products and Chemicals, Inc. Fluorinated polyester tire reinforcement materials. 4,009,304, Cl. 427-322.000.

Dlugos, Daniel F.; and Manduley, Flavio M., to Pitney-Bowes, Inc. Latch strobe generator circuit. 4,009,436, Cl. 324-73.00R.

Dobija, Michael J., to Masonite Corporation. Panel molding system. 4,008,549, Cl. 52-287.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Column-type display stand for flat parallelipipedic articles. 4,008,809, Cl. 211-71.000.

Dohmann, Fritz, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Apparatus for making bevel gear. 4,008,599, Cl. 72-354.000.

Dolan, Donald T.: *See—*
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Doty, Edward Neal: *See—*
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Dow Chemical Company, The: *See—*
Lyon, George W.; and Pearce, Roscoe L., 4,009,083.
Rupprecht, Walter E. F.; Lane, Eckel R.; and Rakshys, Joseph W., Jr., 4,008,544.

Dow Corning Corporation: *See—*
Hagarty, Robert W., 4,008,708.

Dresser Industries, Inc.: *See—*
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Drobnik, Stefan: *See—*
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Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Feldgun, Leon Izrailevich; Drui, Mark Simonovich; Kostjuk, Boris Dmitrievich; Zjukin, Nikolai Stepanovich; Lysanov, Vladislav Sergeevich; and Lavrinovich, Alla Alexandrovna, 4,009,027.

DSO "Montagi": *See—*
Petrov, Radoslav Stanev; Zahariev, Stefan Elenkov; Markov, Ivan Kirilov; and Peychev, Georgi Vassilev, 4,008,596.

Duncan, Lane Scot: *See—*
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Dunn, Michael E.: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
Lauder, Alan; and McCann, Elrey L., III, 4,009,242.
Nebe, William John, 4,009,040.
Norling, Parry McWhinnie, 4,009,150.
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Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., to United Technologies Corporation. Method of repairing surface defects using metallic filler material. 4,008,844, Cl. 228-119.000.

Dyhringer, Waldemar S.: *See—*
Goerke, Paul; and Dyhringer, Waldemar S., 4,008,805.

Dym, Herbert; Lowy, Paul; and Salyer, Greg, to International Business Machines Corporation. Tablet with improved pen height compensation. 4,009,338, Cl. 178-18.000.

Dynamics Research and Manufacturing, Inc.: *See—*
Walker, Grant W., 4,008,915.

Dynamit Nobel Aktiengesellschaft: *See—*
Bendler, Hellmut; Gawlick, Heinz; and Flach, Egon, 4,008,780.
Gawlick, Heinz; Stahlmann, Rudolf; and Jensen, Ernst, 4,008,665.

E. J. Brooks Company: *See—*
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Eastman Kodak Company: *See—*
Abel, Edward P., 4,009,030.
Bober, Thomas W., 4,009,235.
Hammond, Howell Allen; Humphlett, Wilbert Jeptha; and Salminen, Ilmari Fritiof, 4,009,029.
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Eberhardt, William H.: *See—*
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Ecolotrol, Inc.: *See—*
Jeris, John S., 4,009,098.
Jeris, John S., 4,009,099.
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Edo-Aire, a Division of Edo Corporation: *See—*
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Younkin, James R., 4,008,618.

Eggersdorfer, Rolf: *See—*
Hampel, Hans Joachim; Eggersdorfer, Rolf; and Ora, Alpo Johannes, 4,009,088.

Ehrich, Hans; Emshoff, Heiko; and Otto, Hans-Peter, to Anschutz & Co. GmbH. Gyroscopic instrument. 4,008,623, Cl. 74-5.00R.

Einhaus, Albert; Gurnth, Rudi; and Klaus, Siegfried, to Paul Ferd. Peddinghaus, Firma. Holddown device for shears. 4,008,885, Cl. 269-162.000.

Eiteljorg, Harrison, II. Camera and lens case. 4,008,790, Cl. 190-44.000.

Elbe, Ronald E., to United States of America, Army. Modification of rifle adapter assembly to prevent doubling. 4,008,537, Cl. 42-16.000.

Elderbaum, Gilbert J. Method of making ceramic capacitor. 4,008,514, Cl. 29-25.420.

Eli Lilly and Company: *See—*
Boeck, LaVerne D.; and Berg, David H., 4,009,262.

Eliasson, Rune; and Nedenskov, Poul, to Aktieselskabet Grindstedvaerket. 8-(5-Formyl-2-furyl)-octanoic acid. 4,009,187, Cl. 260-347.300.

Elkhart Brass Manufacturing Co., Inc.: *See—*
Thompson, William S., 4,008,735.

Eller, Chauncey B. Alarm system for electrical receptacles. 4,009,474, Cl. 340-280.000.

Elliott, William G.; and Karlinski, Thomas J., to SpectraMetrics, Incorporated. Plasma jet device and method of operating same. 4,009,413, Cl. 315-111.200.

Elloy, Martin Arthur: *See—*
Cavendish, Michael Edward; and Elloy, Martin Arthur, 4,008,495.

Elmer, Otto C., to General Tire & Rubber Company, The. Aqueous alkaline dispersion of vinyl pyridine copolymer, polymethylol glycoluril, and R-F novolak. 4,009,134, Cl. 260-29.300.

Elmer, Thomas H.; Hillman, Arthur E.; Hoekstra, Karl E.; Howell, Robert G.; Rauscher, Herbert E.; and Smith, Charles C., Jr., to Corning Glass Works. Laminated glass body with opal phase produced between laminae. 4,009,318, Cl. 428-420.000.

Elms, Ronald Duane. Positioning determining method and apparatus. 4,009,377, Cl. 235-151.320.

Emerson Electric Co.: *See—*
Stahlhut, Leo G.; and Trantina, Walter J., 4,008,654.

Emhart Industries, Inc.: *See—*
Foster, Thomas Vincent, 4,009,016.
Foster, Thomas Vincent, 4,009,019.
MacMaster, Malcolm D., 4,008,615.
Nebelung, Hermann; and Christopher, Edward Charles, 4,009,018.
Travaglio, Vincent M.; and Magnifico, Michael L., 4,008,873.

Emhart (U.K.) Limited: *See—*
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Emshoff, Heiko: *See—*
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Endo, Takaya: *See—*
Kojima, Tamotsu; Sato, Shui; Endo, Takaya; Usui, Tugumoto; and Horiuchi, Tomio, 4,009,035.

Enoguchi, Yuji: *See—*
Ogawa, Masaya; Enoguchi, Yuji; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 4,008,954.

Enomoto, Hiroshi: *See—*
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsahide; Mori, Tamiki; and Yasutomi, Yasuo, 4,009,206.

Envirex Inc.: *See—*
Smith, George W., 4,009,106.

Epstein, Arthur M.; and Baumayr, Hans E., to Baumayr Instrument Co., Inc. Dental tools. 4,008,521, Cl. 32-27.000.

Ericsson, Ronald J., to Schering Aktiengesellschaft. Fractionation of sperm. 4,009,260, Cl. 424-105.000.

Erikson, J. Alden; and Niederst, Ken W., to PPG Industries, Inc. Polyurea-urethane coatings. 4,009,307, Cl. 427-377.000.

Eriparelis, George Michael: *See—*
Botsis, Nicolaos George; Korobilis, Panayotis Nicolas; Miras, Ioannis Constantin; and Eriparelis, George Michael, 4,008,744.

Erlandson, Paul M.; and Szatkowski, Richard R., to Continental Can Company, Inc. Method for high speed sinter molding. 4,009,234, Cl. 264-24.000.

Erwin Sick Optik-Elektronik: *See—*
Plockl, Johann, 4,008,964.

ESB Incorporated: *See—*
Megahed, El Sayed; Buelow, Carol Ruth; and Spellman, Patrick Joseph, 4,009,056.

Esquire, Inc.: *See—*
Nuver, Eric L. H., 4,009,387.

Esseltepac Aktiebolag: *See—*
Christensson, Od Wikar, 4,008,848.

Essex International, Inc.: *See—*
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Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,008,999.

Etat Francais representé par le Delegue Ministeriel pour l'Armement: *See—*
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Etud S.A.: *See—*
Faivre, Andre; and Tanguy, Pierre, 4,009,368.

Eunipp AG: *See—*
Flisch, Hermann, 4,008,634.

Evans, Dafydd Williams, to Towmotor Corporation. Hydraulic system for electric lift trucks. 4,008,571, Cl. 60-423.000.

Ewing, James H.: *See—*
Alcaide, H. David; and Ewing, James H., 4,008,619.

Exxon Research and Engineering Company: *See—*
Luckenbach, Edward C., 4,009,121.
Whittingham, M. Stanley, 4,009,052.

Ezekiel, Aaron David, to Ciba-Geigy AG. Conversion of 2-aminonaphtho[1,2 d] selenazole to 2-methylnaphtho[1,2 d] selenazole. 4,009,176, Cl. 260-298.000.

F. N. Shepard & Company: *See—*
Reilly, James E.; Klaene, Frank A.; and Dunn, Michael E., 4,008,801.

Fahrenschon, Franz; Jager, Horst; Thinschmidt, Hans; and Meier, Alfred, to Siemens Aktiengesellschaft. Circuit arrangement for communication facilities wherein transmission paths can be employed for different types of message switching. 4,009,342, Cl. 179-2.0DP.

Fairbrother, Robert J.: *See—*
Lines, Ellwood L.; Herbst, John A.; and Fairbrother, Robert J., 4,009,122.

Fairchild Camera and Instrument Corporation: *See—*
Kuo, James Ren-Jke, 4,009,404.

Fairfield Engineering and Manufacturing Company: *See—*
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Faivre, Andre; and Tanguy, Pierre, to Etud S.A. Yoghurt-making machine. 4,009,368, Cl. 219-430.000.

Fansteel Inc.: *See—*
Fry, Stanley S., 4,009,007.

Faraguet, Claude, to Sangamo Weston, Inc. Method and apparatus for measuring material thickness. 4,009,376, Cl. 235-151.300.

Faris, Theodore P. Method for polishing portions of vehicle surfaces. 4,009,303, Cl. 427-287.000.

Farkas, Zoltan D.; and Wilson, Perry B., to United States of America, Energy Research and Development Administration. Passive radio frequency peak power multiplier. 4,009,444, Cl. 328-233.000.

Farmer Bros. Co.: *See—*
Gruner, Helmut J., 4,008,656.

Farmer, Stanley E.; Faust, Donald M.; and Weinert, Harry F., to Cascade Corporation. Telescopic ram. 4,008,648, Cl. 91-168.000.

Farone, Eugene Richard, to Lubrizol Corporation, The. Powder coating compositions and metal objects coated therewith. 4,009,131, Cl. 260-23.00R.

Fassbender, Charles J., to NCR Corporation. PLO phase detector and corrector. 4,009,490, Cl. 360-45.000.

Faust, Donald M.: *See—*
Farmer, Stanley E.; Faust, Donald M.; and Weinert, Harry F., 4,008,648.

Feldgun, Leon Izrailevich: *See—*
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Feldgun, Leon Izrailevich; Drui, Mark Simonovich; Kostjuk, Boris Dmitrievich; Zjukin, Nikolai Stepanovich; Lysanov, Vladislav Sergeevich; and Lavrinovich, Alla Alexandrovna, 4,009,027.

Felske, William L.: *See—*
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Fender, Daniel C.: *See—*
Ament, Roland W.; and Fender, Daniel C., 4,009,259.

Fenske, Gunther: *See—*
Czauderna, Norbert; Fenske, Gunther; Klimek, Karl-Heinz; Lubina, Siegfried; Malinowski, Fritz; and Schonrock, Bernhard, 4,008,921.

Ferd. Ruesch AG: *See—*
Mikulas, Budai, 4,009,065.

Fichter, Barry S.; and Duncan, Lane Scot, to American Standard, Inc. Diverter valve. 4,008,732, Cl. 137-119.000.

Filac Corporation: *See—*
Yen, David H.; Connely, Tim R.; and Lee, John J., 4,008,617.

Filippi, Ernest A., to Stanley Aviation Corporation. Coupling assembly. 4,008,937, Cl. 339-15.000.

Filteron Systems Inc.: *See—*
Behrendt, George H.; and Potter, Jesse L., 4,009,104.

Finke, Klaus-Gunter: *See—*
Kral, Leopold; Finke, Klaus-Gunter; and Webers, Theo, 4,008,814.

Finucane, Thomas P., to General Foods Corporation. Effervescent dipeptide sweetener tablets. 4,009,292, Cl. 426-548.000.

Firmenich S.A.: *See—*
Ohloff, Gunther; and Giersch, Wolfgang K., 4,009,127.

Fischer, Adolf, deceased (by Fischer, Caecilia Emma, heiress-at-law); Hansen, Hanspeter; and Rohr, Wolfgang, to BASF Aktiengesellschaft. O-aminosulfonylglycolic amides. 4,009,192, Cl. 260-456.00A.

Fischer, Caecilia Emma, heiress-at-law: *See—*
Fischer, Adolf, deceased; Hansen, Hanspeter; and Rohr, Wolfgang, 4,009,192.

Fishel, Norman A., to Monsanto Company. Conversion of diphenylethers to dibenzofurans using catalysts containing ceria. 4,009,185, Cl. 260-346.20M.

Fisher, Charles B.: *See—*
Fisher, Sidney T.; and Fisher, Charles B., 4,008,761.
Fisher, Sidney T.; and Fisher, Charles B., 4,008,762.

Fisher, Frank H.: *See—*
Schrader, Carl N.; and Fisher, Frank H., 4,008,517.

Fisher, Sidney T.; and Fisher, Charles B. Method for induction heating of underground hydrocarbon deposits using a quasi-toroidal conductor envelope. 4,008,761, Cl. 166-248.000.

Fisher, Sidney T.; and Fisher, Charles B. Extraction of hydrocarbons in situ from underground hydrocarbon deposits. 4,008,762, Cl. 166-248.000.

Fisk, Robert Walter, to Applied Materials, Inc. Reactor loading apparatus. 4,008,815, Cl. 214-17.00C.

Fisons Limited: *See—*
Macarthur, Donald Ross; and Smith, David Ernest, 4,009,280.

Fitzpatrick, Nigel Patrick; Byrne, James Neville; and MacDonald, Angus James, to Alcan Research and Development Limited. Stirring molten metal. 4,008,884, Cl. 266-233.000.

Flach, Egon: *See—*
Bendler, Hellmut; Gawlick, Heinz; and Flach, Egon, 4,008,780.

Flatt, Joseph; LoPiccolo, Robert C.; and Linsker, Eugene, to Tech Development Inc. Tip turbine inflating device with motor-actuated closure at inlet. 4,008,983, Cl. 417-348.000.

Flatt, Richard P.; and Link, Edwin A., to RTE Corporation. High voltage cable terminator having a fault actuated probe. 4,008,943, Cl. 339-111.000.

Flemming, Donald C., to International Business Machines Corporation. Inter-related switching, activity compression and demand assignment. 4,009,344, Cl. 179-15.0BS.

Flemming, Donald C.; and Markey, Harold G., to International Business Machines Corporation. External management of satellite linked exchange network. 4,009,345, Cl. 179-15.0BA.

Flemming, Donald C.; Markey, Harold G.; Metz, Ralph J.; and West, Lynn P., to International Business Machines Corporation. Modular branch exchange and nodal access units for multiple access systems. 4,009,347, Cl. 179-15.0BS.

Flisch, Hermann, to Eunipp AG. Multispindle automatic lathe. 4,008,634, Cl. 82-3.000.

Flowers, Dervin L.; and Greeson, Richard L., to Motorola, Inc. Tin strip formulation for metal to glass seal diodes. 4,009,299, Cl. 427-82.000.

Fohl, Artur. Winding-up roller for safety belts. 4,008,863, Cl. 242-107.40B.

Foley, James P., to Roanwell Corporation. Telephone apparatus including electrical connector. 4,008,940, Cl. 339-91.00R.

Ford Motor Company: *See—*
Braun, Paul E.; and Sterner, Melvin F., 4,008,699.

Foreman, Robert W., to Park Chemical Co. Pelletized rectifier for molten neutral salt baths and method. 4,009,112, Cl. 252-71.000.

Forster Mfg. Co., Inc.: *See—*
Stuart, Meredith, 4,008,812.

Forsyth, Emil John, to Rexnord Inc. Chain driven roller conveyor with closure plates. 4,008,800, Cl. 198-782.000.

Fort, Pierre Henri Marie; and Pierrel, Michel, to Pont-A-Mousson S.A. Casing for a machine for centrifugally casting pipes in a rotary mould. 4,008,751, Cl. 164-153.000.

Foster Grant Co., Inc.: *See—*
Kravitz, Rubin, 4,008,605.

Foster, Thomas Vincent, to Emhart Industries, Inc. Method of making glassware with a high speed press and blow technique. 4,009,016, Cl. 65-76.000.

Foster, Thomas Vincent, to Emhart Industries, Inc. Blowhead assembly for high speed press and blow individual section glassware forming machine. 4,009,019, Cl. 65-261.000.

Fox, Irwin, to Ironite Products Company. Method of using a porous Fe_2O_3 drilling mud additive. 4,008,775, Cl. 175-64.000.

Frank, Konrad; and Klon, Peter F., to United States of America, Army. Method and apparatus for beam sampling by acoustic pulses. 4,008,966, Cl. 356-218.000.

Frechet, Daniel: *See—*
Nedelec, Lucien; and Frechet, Daniel, 4,009,273.
Frederick, Howard M.: *See—*
Cardon, Bartley P.; and Frederick, Howard M., 4,009,268.
Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable polyolefin composition containing an N-halo lactam. 4,009,324, Cl. 526-6.000.
Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable polyolefin composition containing an N-halo urethane. 4,009,325, Cl. 526-6.000.
Freedom, John: *See—*
Khoshaba, Mushie, 4,008,900.
Freitag, Dieter: *See—*
Neuray, Dieter; Tresper, Erhard; and Freitag, Dieter, 4,009,148.
Freitag, Samuel L., to Acura-Med. Surgical needle retaining and inventory pad, and accounting method. 4,008,802, Cl. 206-63.300.
Frentzel, Herman C.; and Frentzel, Thomas H., to Frentzel Products, Inc. Bicycle lock assembly. 4,008,587, Cl. 70-235.000.
Frentzel Products, Inc.: *See—*
Frentzel, Herman C.; and Frentzel, Thomas H., 4,008,587.
Frentzel, Thomas H.: *See—*
Frentzel, Herman C.; and Frentzel, Thomas H., 4,008,587.
Fried, John H.; and Harrison, Ian T., to Syntex Corporation. 2-(6-Substituted-2'-naphthyl) acetic acid derivatives and the salts and esters thereof. 4,009,197, Cl. 260-473.00F.
Frigoscandia Contracting, Inc.: *See—*
Heber, Gerald James; and Roxburgh, Daniel Arthur George, 4,008,580.
Fritsche, G. Ray: *See—*
Crissman, James H.; and Fritsche, G. Ray, 4,009,089.
Fry, Stanley S., to Fansteel Inc. Tantalum powder and method of making the same. 4,009,007, Cl. 29-182.500.
Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; Ohi, Reiichi; Yamada, Minoru; Yokoo, Kenji; and Hara, Hiroshi, 4,009,038.
Masuda, Takao; and Sekikawa, Nobuyoshi, 4,009,039.
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.
Fujie, Hiroshi: *See—*
Noma, Takashi; Fujie, Hiroshi; and Ozawa, Shuji, 4,009,154.
Fujimaki, Hiroto; Kodama, Fumio; Takabe, Reiho; Asano, Kiro; and Seguchi, Koji, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Process for the surface treatment of carbon fibers. 4,009,305, Cl. 427-399.000.
Fujimoto, Ted Tsutomu, to Rohm and Haas Company. Selective antagonists for triazine herbicides. 4,009,022, Cl. 71-93.000.
Fujimoto, Toyohisa: *See—*
Numasaki, Kouichi; Ninomiya, Nobutaka; Matsumoto, Zenji; Adachi, Kiyoshi; and Fujimoto, Toyohisa; 4,008,994.
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigchiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, to Sumitomo Chemical Company, Limited. Antimicrobial composition and method containing N-(3,5-dihalophenyl)-imide compounds. 4,009,278, Cl. 424-274.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,009,159.
Fujita, Yukio: *See—*
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsahide; Mori, Tamiki; and Yasutomi, Yasuo, 4,009,206.
Fujitsu Ltd.: *See—*
Kodera, Tsuguo; and Hanatani, Kiyokazu, 4,009,467.
Tanaka, Atsuo; Tokura, Koichi; and Kawahara, Hiroki, 4,009,471.
Fujiwara, Akinobu. Apparatus for producing electricity in case of fire. 4,009,055, Cl. 429-112.000.
Fujiwara, Takao: *See—*
Ogawa, Masaya; Enoguchi, Yuji; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 4,008,954.
Fukagawa, Kiyoshi, to Toyo Suisan Kaisha Ltd. Method of preparing instant wontons containing a filler. 4,009,288, Cl. 426-297.000.
Fukuhara, Yoichi: *See—*
Yamamura, Harukiti; Karatsu, Takeharu; and Fukuhara, Yoichi, 4,008,657.
Fukui, Kiyotake: *See—*
Ishigaki, Yukinobu; and Fukui, Kiyotake, 4,009,455.
Fukui, Masahiko; and Kamata, Yasuji, to Hitachi Metals, Ltd.; and Hitachi, Ltd. Inductor. 4,009,460, Cl. 336-110.000.
Fullenkamp, Anthony L.: *See—*
Crane, Herbert R.; and Fullenkamp, Anthony L., 4,008,502.
Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, to Montedison Fibre S.p.A. Process for the preparation of alkylene carbonates. 4,009,183, Cl. 260-340.200.
Furukawa, Jun-ichi; Kono, Yoshinao; and Sakaguchi, Kahei, to Kao Soap Co., Ltd. Sizing agent for glass fibers. 4,009,132, Cl. 260-29.2UA.
GAF Corporation: *See—*
Hort, Eugene V., 4,009,326.
Gager, Dennis J., to Raymond Lee Organization, Inc., The, a part interest. Inflatable sole shoe. 4,008,530, Cl. 36-28.000.
Gainer, James V., Jr., to University of Virginia, The. Method for treating spinal cord injury. 4,009,270, Cl. 424-195.000.
Gallagher, John J. Lightweight end connectors for pollution containment boom. 4,008,575, Cl. 61-1.00F.
Gandrud, Dale E.: *See—*
Gandrud, Ebenhard S.; and Gandrud, Dale E., 4,008,833.
Gandrud, Ebenhard S.; and Gandrud, Dale E. Chemical applicator. 4,008,833, Cl. 222-178.000.
Garberi, Sergio; and Bertino, Lorenzo, to Ing. C. Olivetti & C., S.p.A. Removable cartridge for the inked ribbon for typewriters, calculating machines or other office machines. 4,008,795, Cl. 197-161.000.
Gardner, Harry R.; and Marlatt, Charles D., to Western Railspan Inc. Railroad track alarm. 4,008,870, Cl. 246-120.000.
Gardner, Jeffrey O. Noise making slip sinker. 4,008,539, Cl. 43-42.310.
Garetti, Enzo: *See—*
Calcagno, Piero; Garetti, Enzo; and Lobisch, Gunter, 4,009,468.
Gartner, Todd Henry, to Motorola, Inc. High energy adaptive ignition system. 4,008,698, Cl. 123-117.00R.
Gassner, Hans; and Kress, Manfred, to Kugelfischer Georg Schafer & Co. False twisting device. 4,008,563, Cl. 57-77.450.
Gawlick, Heinz; Stahlmann, Rudolf; and Jensen, Ernst, to Dynamit Nobel Aktiengesellschaft. Training ammunition. 4,008,665, Cl. 102-41.000.
Gawlick, Heinz: *See—*
Bendler, Hellmut; Gawlick, Heinz; and Flach, Egon, 4,008,780.
Geierhaas, Herbert; Ripperger, Willi; and Herrmann, Walter, to BASF Aktiengesellschaft. Spherical refining catalyst and process for its manufacture. 4,009,125, Cl. 252-465.000.
General American Transportation Corporation: *See—*
Hurst, Doug; and Mowatt-Larssen, Erling, 4,008,739.
General Aquadyne, Inc.: *See—*
Ligman, James R., 4,009,419.
General Concrete of Canada Limited: *See—*
Aylon, Norman N., 4,008,796.
General Dynamics Corporation: *See—*
Ashley, Glen W., Jr.; Buenting, Ernest O.; Leonard, Charles A.; and Lessman, Gerhard, 4,009,393.
General Electric Company: *See—*
Bennett, Ronald E., 4,009,418.
Gleichman, Robert F., 4,009,405.
Horvay, Julius B., 4,008,579.
Koenig, Paul W., 4,009,485.
Mullersman, Ferdinand H., 4,009,429.
Nichols, Frank S.; Bliss, Charles H.; and Londergan, Robert J., 4,009,141.
Petrillo, Vincent Carmen, 4,008,573.
Usry, Gerald O., 4,009,461.
Waldon, Paul L.; and Bennett, Ronald E., 4,009,417.
Whitt, James A., 4,008,787.
Whitt, James A., 4,008,788.
General Foods Corporation: *See—*
Finucane, Thomas P., 4,009,292.
Mitchell, William A.; Seidel, William C.; and Orozovich, George E., 4,009,291.
General Microwave Corporation: *See—*
Hopfer, Samuel, 4,009,456.
General Motors Corporation: *See—*
Devers, Melvin W.; and Felske, William L., 4,008,747.
Johnson, Lauren L., 4,009,431.
Smale, Charles H., 4,008,978.
Spears, Esten W., Jr.; and Young, Eugene R., 4,008,568.
General Signal Corporation: *See—*
Grossi, Benedetto, 4,008,942.
General Solar Power Corporation: *See—*
Kazis, Earle W.; Mark, Robert; and Wetherell, Thomas J., 4,009,051.
General Tire & Rubber Company, The: *See—*
Elmer, Otto C., 4,009,134.
Scobbo, James Joseph, 4,009,310.
Welch, John Alan, 4,008,743.
Genesport Industries Limited: *See—*
Schonbrun, Tibor; and Tremblay, Victorien, 4,008,531.
Geo. A. Hormel & Co.: *See—*
Ostojic, Nedeljko; and Boscak, Vladimir G., 4,008,621.
Gerbier, Gerard, to Saft-Societe des Accumulateurs Fixes et de Traction; and Compagnie Industrielle des Piles Electriques "Cipel". Air depolarization cell or battery. 4,009,320, Cl. 429-27.000.
Gerling, John E.: *See—*
Tallmadge, Gene E.; and Gerling, John E., 4,009,359.
Gerry, Martin E. Distortionless modulation head. 4,009,491, Cl. 360-125.000.
Gibson, Joseph Paul, Jr.: *See—*
Wren, William Arthur, Jr.; and Gibson, Joseph Paul, Jr., 4,008,499.
Gibson, Myron R., to Caterpillar Tractor Co. Corner seal for rotary mechanisms. 4,008,986, Cl. 418-51.000.
Giersch, Wolfgang K.: *See—*
Ohloff, Gunther; and Giersch, Wolfgang K., 4,009,127.
Gilbert, Harold James, deceased (by Gilbert, Olive, executrix); and McConnell, Edmund Alexander, to Wickman Machine Tool Sales Limited. Multi spindle lathes. 4,008,633, Cl. 82-3.000.
Gilbert, Harold James, deceased (by Gilbert, Olive Gertrude, executrix); and McConnell, Edmund Alexander, to Wickman Machine Tool Sales Limited. Multi spindle lathes. 4,008,635, Cl. 82-30.000.
Gilbert, Olive, executrix: *See—*
Gilbert, Harold James, deceased; and McConnell, Edmund Alexander, 4,008,633.
Gilbert, Olive Gertrude, executrix: *See—*
Gilbert, Harold James, deceased; and McConnell, Edmund Alexander, 4,008,635.

Gilchrist, David Stuart: *See—*
Clarke, John Michael; and Gilchrist, David Stuart, 4,008,989.

Gilissen, Hermanus Petrus Johannes; and van Dijk, Petrus Richardus Martinus, to AMP Incorporated. Elastomeric connector and its method of manufacture. 4,008,519, Cl. 29-625.000.

Glass, Joseph Edward, Jr.: *See—*
Arney, William Charles; Williams, Clarence Alfred; and Glass, Joseph Edward, Jr., 4,009,329.

Gleichman, Robert F., to General Electric Company. Vertically mountable dynamoelectric machine having an improved ventilating coolant flow control structures. 4,009,405, Cl. 310-58.000.

Gochermann, Hans; and Rusch, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Terrestrial solar cell generator. 4,009,054, Cl. 136-89.00P.

Godchaux-Henderson Sugar Co., Inc.: *See—*
Petri, Peter H., 4,009,045.

Goerke, Paul; and Dyhringer, Waldemar S. Apparatus and method for sorting objects according to length. 4,008,805, Cl. 209-73.000.

Goffe, William L., to Xerox Corporation. Reversal migration imaging system. 4,009,028, Cl. 96-1.0PS.

Gogarty, William B.; and Merrill, LaVaun S., Jr., to Marathon Oil Company. Process for reducing the settling rate of comminuted porous solids in a water-solids slurry. 4,008,924, Cl. 302-66.000.

Goldman, Myron D.: *See—*
Marshall, Edward C.; and Goldman, Myron D., 4,008,663.

Goldmark Communications Corporation: *See—*
Goldmark, Peter C.; Dolan, Donald T.; Desai, Arvind C.; and Hollywood, John M., 4,009,331.

Goldmark, Peter C.; Dolan, Donald T.; Desai, Arvind C.; and Hollywood, John M., to Goldmark Communications Corporation. Still picture program video recording composing and playback method and system. 4,009,331, Cl. 358-127.000.

Goldwasser, Robert E.: *See—*
De Koning, Joseph G.; Goldwasser, Robert E.; and Hamilton, Robert J., Jr., 4,009,446.

Gonnet, Robert: *See—*
Courant, Jacques; Gonnet, Robert; and Thore, Marc, 4,008,733.

Good, Albert E. Saw chain assembly. 4,008,640, Cl. 83-833.000.

Goodman, David S.: *See—*
Anhalt, John W.; Goodman, David S.; and Oliver, Leland W., 4,008,938.

Goodrich, John J., to St. Regis Paper Company. Gusseted pinch bottom bag. 4,008,850, Cl. 229-55.000.

Goodyear Aerospace Corporation: *See—*
Meller, Oscar W.; and Lovich, John W., 4,008,936.

Goodyear Tire & Rubber Company, The: *See—*
Tazuma, James J.; and Muse, Joel, 4,009,228.

Gordon, Robert L., to International Paper Company. Leakproof paperboard container. 4,008,846, Cl. 229-4.500.

Gordos, Ambrose L. Weight adjustor assembly. 4,008,896, Cl. 273-171.000.

Goretz, Heinz: *See—*
Meyer, Frank; Becker, Helmut; and Goretz, Heinz, 4,008,576.

Gould Inc.: *See—*
Wolf, Alby Henry, 4,009,322.

Goussard, Alain, to Construction Mills-K. Electric circuit for self-propelling trolleys in storage installations. 4,008,668, Cl. 104-88.000.

Graffunder, Horst: *See—*
Wittmann-Liebold, Brigitte; Graffunder, Horst; and Kohls, Heinz, 4,008,736.

Gratzmuller, Jean Louis. Electric circuit-breaker for alternating currents. 4,009,358, Cl. 200-150.00B.

Grau, Gerhard, to Zinser Textilmaschinen GmbH. Open-end spinning device. 4,008,561, Cl. 57-56.000.

Green, Robin John; Key, Michael David; and Murray, Keith William, to Lever Brothers Company. Enzyme granules. 4,009,076, Cl. 195-63.000.

Green, Robin John; and Johnson, Richard Shaw, to Lever Brothers Company. Protection of materials. 4,009,113, Cl. 252-95.000.

Greenberger, William, to Hopp Press, Inc., The. Price marker. 4,008,533, Cl. 40-70.00R.

Greenwald, Richard B., to Polaroid Corporation. N-(lower alkyl sulfonyl-methyl sulfonyl)-piperazines. 4,009,167, Cl. 260-268.00S.

Greeson, Richard L.: *See—*
Flowers, Dervin L.; and Greeson, Richard L., 4,009,299.

Greis, Ulrich: *See—*
Deml, Reinhold; and Greis, Ulrich, 4,009,386.

Griffith, James M.; and Henry, Walter L., to United States of America, America. Ultrasonic diagnostic technique utilizing switched gain signal processing. 4,008,713, Cl. 128-2.05Z.

Griffiths, Kenneth F. Clasp. 4,008,513, Cl. 24-201.00A.

Grimes, Terrence L.; and Neis, Thomas W., to Sperry Rand Corporation. Apparatus for indicating attitude failure. 4,009,464, Cl. 340-27.0AT.

Grohmann, Lothar, to International Standard Electric Corporation. Superheterodyne receiver with a digitally adjustable tuning arrangement. 4,009,438, Cl. 325-421.000.

Grolig, Johann; Martin, Manfred; and Scharfe, Gerhard, to Bayer Aktiengesellschaft. Preparation of isopropyl chloride. 4,009,216, Cl. 260-663.000.

Grosse-Benne, Wilhelm: *See—*
Beermann, Paul; and Grosse-Benne, Wilhelm, 4,008,666.

Grossi, Benedetto, to General Signal Corporation. Printed circuit board holding spring. 4,008,942, Cl. 339-91.00R.

Grossmann, Max: *See—*
Deubel, Reinhold; Grossmann, Max; Hemmerling, Volker; and Uhrig, Heinz, 4,009,142.

Groth, Gerhard: *See—*
Braeger, Horst; and Groth, Gerhard, 4,008,509.

Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T.: *See—*
Belperin, Gerard, 4,008,926.

Groupement d'Interet Economique: *See—*
Moll, Manfred; Durand, Gilbert; and Blachere, Henri, 4,009,286.

Grow Chemical Corporation: *See—*
Offerman, Sidney, 4,009,144.

Gruner, Helmut J., to Farmer Bros. Co. Brewing apparatus. 4,008,656, Cl. 99-298.000.

GTE Sylvania Incorporated: *See—*
Buescher, William E.; and Kerstetter, Donald R., 4,009,409.
Latassa, Frank M., 4,009,412.
Puhak, Peter George, 4,009,411.

Guery, Jean-Pierre; and Lacan, Guy, to La Telemecanique Electrique. Electro-magnetic contactor. 4,009,457, Cl. 335-132.000.

Gulf Oil Corporation: *See—*
Cahoy, Roger P., 4,009,210.

Gulf Research & Development Company: *See—*
Crissman, James H.; and Fritsche, G. Ray, 4,009,089.
Massoth, Franklin E.; and Young, John E., Jr., 4,009,009.
Onopchenko, Anatoli; and Schulz, Johann G. D., 4,009,211.

Gunnergaard, Marius, to Dansk Industri Syndikat A/S. Method of inserting cores in a sand mold. 4,008,748, Cl. 164-30.000.

Gurnth, Rudi: *See—*
Einhaus, Albert; Gurnth, Rudi; and Klaus, Siegfried, 4,008,885.

Guyler, Karl Edward: *See—*
Redmond, John Peter; Andrews, Daniel Marshall; and Guyler, Karl Edward, 4,009,297.

H. R. Electronics Company: *See—*
Levasseur, Joseph L.; and Lee, Larry D., 4,008,792.

Haake, Heinz: *See—*
Schenk, Gerd; and Haake, Heinz, 4,009,053.

Habelt, Gerhard, to U.S. Philips Corporation. Cassette recording apparatus with automatic loading. 4,009,493, Cl. 360-137.000.

Hagarty, Robert W., to Dow Corning Corporation. Solar energy collector. 4,008,708, Cl. 126-270.000.

Hagenuk & Co. GmbH: *See—*
Beermann, Paul; and Grosse-Benne, Wilhelm, 4,008,666.

Hague, Robert Z.; Loos, George J.; and Marsicano, Matthew F., to Textron, Inc. Method of transporting toolholder. 4,008,515, Cl. 29-426.000.

Hague, Robert Z.; Loos, George J.; and Marsicano, Matthew F., to Textron, Inc. Machine tools. 4,008,518, Cl. 29-568.000.

Hague, Robert Z.; Loos, George J.; and Marsicano, Matthew F., to Textron, Inc. Machine tools. 4,008,646, Cl. 90-11.00A.

Hague, Robert Z.; Loos, George J.; and Marsicano, Matthew F., to Textron, Inc. Machine tools. 4,008,647, Cl. 90-11.00R.

Hahn, Robert S.; Holmstrom, Bruno A.; St. Andre, Arthur F.; and Youden, David H., to Cincinnati Milacron-Heald Corporation. Machine tool. 4,008,631, Cl. 82-1.00C.

Haines, Rolf: *See—*
Ruback, Keith; and Haines, Rolf, 4,008,557.

Hajime, Asami: *See—*
Tadashi, Zenbutsu; Hajime, Asami; Seiichi, Uemura; and Takao, Hirose, 4,009,308.

Hall, Clarence Addison, Jr. Fishing boat platform. 4,008,500, Cl. 9-7.000.

Hall, Robert E.; and Lamar, Clyde, to W. E. Hall Company. Method and apparatus for flanging a length of spirally wound corrugated pipe. 4,008,592, Cl. 72-70.000.

Hamilton, Robert H.; and Mohr, John L., to McDonnell Douglas Corporation. Averaging counter. 4,009,371, Cl. 235-92.0LG.

Hamilton, Robert J., Jr.: *See—*
De Koning, Joseph G.; Goldwasser, Robert E.; and Hamilton, Robert J., Jr., 4,009,446.

Hammond, Howell Allen; Humphlett, Wilbert Jeptha; and Salminen, Ilmari Fritiof, to Eastman Kodak Company. Cyanoethyl-containing blocked development restrainers. 4,009,029, Cl. 96-3.000.

Hampel, Hans Joachim; Eggersdorfer, Rolf; and Ora, Alpo Johannes, to Rauma-Repola Oy. Process for producing aqueous solutions of sodium, ammonium and magnesium sulphite. 4,009,088, Cl. 204-180.00P.

Hanada, Minoru: *See—*
Kimura, Takashi; Kawashima, Giichi; Nagami, Minoru; and Hanada, Minoru, 4,009,237.

Hanatani, Kiyokazu: *See—*
Kodera, Tsuguo; and Hanatani, Kiyokazu, 4,009,467.

Hanaway, Roger D., to Allis-Chalmers Corporation. Self-raising bin loading auger for combines. 4,008,819, Cl. 214-522.000.

Hanley, Stephen T., to United States of America, Navy. Radiation focus meter. 4,009,392, Cl. 250-338.000.

Hansen, Hanspeter: *See—*
Fischer, Adolf, deceased; Hansen, Hanspeter; and Rohr, Wolfgang, 4,009,192.

Hara, Hiroshi: *See—*
Arai, Atsuaki; Ohi, Reiichi; Yamada, Minoru; Yokoo, Kenji; and Hara, Hiroshi, 4,009,038.

Harada, Masanori, to Nissan Motor Co., Ltd. Method and apparatus for purifying exhaust gases. 4,008,570, Cl. 60-299.000.

Hardy, Peter D., to Metal Box Limited, The. Packaging machines and methods of packaging articles. 4,008,554, Cl. 53-30.00R.

Harrell, Washington. Ignition switch security shield protection against car theft. 4,008,589, Cl. 70-424.000.

Harreus, Albrecht; Muller, Eberhard; and Schultz, Gerhart, to Hoechst Aktiengesellschaft. Additive for mortar and concrete. 4,009,135, Cl. 260-29.4UA.

Harris-Intertype Corporation: *See*—
Crum, James N.; and Treff, Ernest H., 4,008,664.

Harris, Richard Wayne; and Lee, Harry Thomas, to Lockheed Missiles & Space Company, Inc. Digitally controlled variable conductance. 4,009,400, Cl. 307-233.00A.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 4,009,197.

Harrison, Leonard E., to Royal Industries, Inc. Grain bin sweep auger with torque arm. 4,008,816, Cl. 214-17.0DA.

Harry H. Bell & Sons, Inc.: *See*—
LaPine, Robert L.; and Crepeau, Melvin J., 4,008,508.

Hartmann, Helmut: *See*—
Stein, Werner; and Hartmann, Helmut, 4,009,213.

Hartwell Corporation: *See*—
Noyce, George, 4,008,594.

Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Device for severing a veneer sheet. 4,008,639, Cl. 83-371.000.

Hasegawa, Ryozo, to Kabushiki Kaisha Daini Seikosha. Divider for an electronic timepiece. 4,009,445, Cl. 328-49.000.

Hashimoto, Masashi: *See*—
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,009,159.

Haupt, Hans Otto: *See*—
Bremer, Robert Charles, Jr.; and Haupt, Hans Otto, 4,008,600.

Hayasaka, Toshimi: *See*—
Tsuda, Hiroshi; and Hayasaka, Toshimi, 4,008,946.

Hayashi, Ikuya; Uno, Keiichi; and Matsuoka, Mikio, to Toyo Boseki Kabushiki Kaisha. Heat-adhesive film laminate. 4,009,312, Cl. 428-213.000.

Hayashi, Toshikazu: *See*—
Masaki, Mitsuo; Matsunami, Satoshi; Kita, Jyunichiro; and Hayashi, Toshikazu, 4,009,168.

Hayashi, Toshio, to Kayabakogyo-Kabushiki-Kaisha. Recycle treatment of waste water from nickel plating. 4,009,101, Cl. 210-28.000.

Hayes, John C.: *See*—
Pollitzer, Ernest L., and Hayes, John C., 4,009,096.
Pollitzer, Ernest L.; and Hayes, John C., 4,009,123.
Pollitzer, Ernest L.; and Hayes, John C., 4,009,220.

Haynes, Harold L.: *See*—
Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., 4,009,317.

Hayosh, Thomas D.; and Carosella, John H., to Schiller Industries, Inc. Polyphase scanner for bar code symbols. 4,009,369, Cl. 235-61.11E.

Hayward, Lionel Alan Walter. Sugar containing foodstuffs. 4,009,293, Cl. 426-659.000.

Healy, Lawrence W.; Wang, Wu Lan; and Wang, Tsu-Huai, to Tenneco Chemicals, Inc. Chemical compositions and process. 4,009,315, Cl. 428-310.000.

Hebbar, Ranna K.: *See*—
Bennion, Douglas N.; Hebbar, Ranna K.; and Deshpande, Sanjay L., 4,009,323.

Heber, Gerald James; and Roxburgh, Daniel Arthur George, to Frigoscandia Contracting, Inc. Initial quick freeze pan for direct refrigerant contact cooler. 4,008,580, Cl. 62-376.000.

Heberlein Maschinenfabrik AG: *See*—
Schnetzer, Max; and Merimaki, Risto, 4,008,560.

Heckman, Russell W.; Koluch, Joseph S.; and Rhoads, Roger R., to Owens-Illinois, Inc. Method for powder coating. 4,009,301, Cl. 427-195.000.

Heffler, Martin. Filter element retainer construction. 4,009,012, Cl. 55-483.000.

Heim, Wolfgang; Kleemann, Axel; Kolb, Heinz; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Continuous process for recovery of glycide. 4,009,188, Cl. 260-348.50L.

Hemmerling, Volker: *See*—
Deubel, Reinhold; Grossmann, Max; Hemmerling, Volker; and Uhrig, Heinz, 4,009,142.

Henkel & Cie G.m.b.H.: *See*—
Stein, Werner; and Hartmann, Helmut, 4,009,213.

Henmi, Ichiro: *See*—
Nagano, Kentaro; Henmi, Ichiro; and Kiyota, Masahiro, 4,008,843.

Henry, Walter L.: *See*—
Griffith, James M.; and Henry, Walter L., 4,008,713.

Herbert, Donald H. Aircraft supported launchable weapon release assembly. 4,008,645, Cl. 89-1.50R.

Herbst, John A.: *See*—
Lines, Ellwood L.; Herbst, John A.; and Fairbrother, Robert J., 4,009,122.

Hercules Incorporated: *See*—
Chien, James C. W.; and Schappell, Frederick George, 4,009,294.
Vandenberg, Edwin J., 4,009,128.

Herr, Milton E.; and Johnson, Roy A., to Upjohn Company, The. Antiinflammatory and antithrombotic compositions and method of use. 4,009,283, Cl. 424-317.000.

Herrmann, Hans H.; and Herrmann, Karl H., to CTEC Corporation. Hydraulically powered steering system for a vehicle having multiple steerable wheels. 4,008,783, Cl. 180-140.000.

Herrmann, Karl H.: *See*—
Herrmann, Hans H.; and Herrmann, Karl H., 4,008,783.

Herrmann, Walter: *See*—
Geierhaas, Herbert; Ripperger, Willi; and Herrmann, Walter, 4,009,125.

Hertel, Heinz E., to Bell & Howell Company. Web roll retainer. 4,008,861, Cl. 242-68.000.

Herz, Luis: *See*—
Mundlos, Eberhard; Mohr, Reinhard; and Herz, Luis, 4,009,162.

Herzstein, Gwendolyn Marie. Yarn threader and method of threading a needle. 4,008,836, Cl. 223-99.000.

Hess, Klaus; Stickel, Richard; Nagel, Otto; Sinn, Richard; and Daucher, Hans, to BASF Aktiengesellschaft. Method of treating waste water with jet nozzles. 4,009,100, Cl. 210-14.000.

Hester, Jackson B., Jr., to Upjohn Company, The. 1-[(Aminooxy)-methyl]-6-substituted-4H-s-triazolo[4,3-a][1,4] benzodiazepines. 4,009,175, Cl. 260-296.00T.

Hewlett-Packard Company: *See*—
Musch, Bernard E., 4,009,379.

Hibyan, Edward Stanley: *See*—
Noehren, William Lawrence; and Hibyan, Edward Stanley, 4,008,980.

Hicks, Clarence W. Garment collar protector. 4,008,494, Cl. 2-60.000.

Hiemer, Armin Alexander; and Jager, Siegfried Hermann, to Upjohn Company, The. Mold pivoting mechanism. 4,008,990, Cl. 425-454.000.

Higgins, Jerry G.: *See*—
Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 4,009,140.

Hild, Werner: *See*—
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,009,116.

Hilfman, Lee, to UOP Inc. Process for the regeneration of a solid bed metal phthalocyanine catalyst system. 4,009,120, Cl. 252-413.000.

Hilgenbrink, John T.: *See*—
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Hill, David George: *See*—
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,009,169.

Hillman, Arthur E.: *See*—
Elmer, Thomas H.; Hillman, Arthur E.; Hoekstra, Karl E.; Howell, Robert G.; Rauscher, Herbert E.; and Smith, Charles C., Jr., 4,009,318.

Himmelman, Louis F., deceased; and Himmelman, William F., executor. Gas control valve for gas shielded electric welding torches. 4,008,878, Cl. 251-257.000.

Himmelman, William F., executor: *See*—
Himmelman, Louis F., deceased; and Himmelman, William F., executor, 4,008,878.

Himmelsbach, Paul, to Jos. Schneider & Co. Optische Werke Kreuznach. Control mechanism for optical system with independently movable components. 4,008,951, Cl. 350-187.000.

Hironaka, Shun-ichi: *See*—
Ueda, Takeshi; Koizumi, Kunihei; Otani, Tatsu; and Hironaka, Shun-ichi, 4,009,081.

Hirosawa, Koichiro: *See*—
Murakami, Noboru; and Hirosawa, Koichiro, 4,008,630.

Hirsch, John L., to Curt G. Joa, Inc. Adhesive tape bag closure. 4,008,851, Cl. 229-62.000.

Hirsch, Joseph. Torque control system. 4,008,567, Cl. 60-39.28P.

Hisamitsu Pharmaceutical Co., Inc.: *See*—
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Miyata, Satoru; and Ide, Hiroyuki, 4,009,166.

Hisatomi, Takashi, to Nissan Motor Co., Ltd. Carburetor for optimum control of an air-fuel mixture supply to the engine during deceleration. 4,008,696, Cl. 123-97.00B.

Hitachi, Ltd.: *See*—
Fukui, Masahiko; and Kamata, Yasuji, 4,009,460.
Kishi, Tuneo; Itoh, Hiroshi; Tamura, Masaoki; Nakano, Seizo; and Hosokawa, Masao, 4,009,458.
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Hitachi Metals, Ltd.: *See*—
Fukui, Masahiko; and Kamata, Yasuji, 4,009,460.

Hite, Perry J., Sr.: *See*—
Vercellotti, Leonard C.; and Hite, Perry J., Sr., 4,009,463.

Hobart Corporation: *See*—
Crane, Herbert R.; and Fullenkamp, Anthony L., 4,008,502.

Hobbs, Leonard E. Washing device. 4,008,968, Cl. 401-207.000.

Hoechst Aktiengesellschaft: *See*—
Dany, Franz-Josef; Wortmann, Joachim; and Kandler, Joachim, 4,009,137.
Deubel, Reinhold; Grossmann, Max; Hemmerling, Volker; and Uhrig, Heinz, 4,009,142.
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Leupold, Ernst Ingo; and Arpe, Hans-Jurgen, 4,009,209.
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Hoekstra, Karl E.: *See*—
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Hoepfl, Joseph R.; and Ballendux, Gerardus M., to Allis-Chalmers

Corporation. Sun gear retainer in planetary gearset. 4,008,629, Cl. 74-781.00R.
Hofer, Bruce Edward, to Tektronix, Inc. Gated ramp generator. 4,009,399, Cl. 307-228.000.
Hoffman, Joseph Adrian, to American Cyanamid Company. Carbamoylalkyl substituted poly(phosphine oxide) flame-retardants. 4,009,207, Cl. 260-558.00A.
Hoffmann, Herwig: *See*—
Laurer, Peter Rudolf; Schroeder, Wolfgang; Hoffmann, Herwig; and Lingk, Heinz, 4,009,124.
Hoffmann-La Roche Inc.: *See*—
Baggiolini, Enrico; Confalone, Pasquale Nicholas; Pizzolato, Giacomo; and Uskokovic, Milan Radoje, 4,009,172.
Berger, Leo; and Corraz, Alfred John, 4,009,181.
Hofstetter, Helga, to Siemens Aktiengesellschaft. Switching arrangement for telecommunication switching systems. 4,009,351, Cl. 179-18.0GE.
Hoge, William H., to Bio-Industries, Inc. Process for making alcohol from cellulosic material using plural ferments. 4,009,075, Cl. 195-33.000.
Hogg, Walter R., to Coulter Electronics, Inc. Apparatus for preservation and identification of particles analyzed by flow-through apparatus. 4,009,435, Cl. 324-71.0CP.
Hogg, Walter R.: *See*—
Coulter, Wallace H.; Hogg, Walter R.; Longman, Millard D., Jr.; Campbell, Stephen; and Doty, Edward Neal, 4,009,443.
Holcomb, Don R.; and Kline, Arthur J., Jr., to Motorola, Inc. Phase locked loop tracking filter having enhanced attenuation of unwanted signals. 4,009,450, Cl. 331-17.000.
Holland, Ada R., to Raymond Lee Organization, Inc., The, a part interest. Lamp scent unit. 4,009,384, Cl. 240-108.00R.
Hollywood, John M.: *See*—
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Holstein, Frederick W. Carpenter's tool. 4,008,741, Cl. 145-46.000.
Holt, John Frederick Dent. Method of making stained glass effect articles. 4,009,309, Cl. 428-38.000.
Holzl, Robert A., to Chemetal Corporation. Cutting tool and method for making same. 4,008,976, Cl. 408-144.000.
Honeywell Inc.: *See*—
Bockett-Pugh, Charles Paul, 4,009,414.
Chaffin, John H., III, 4,009,300.
Przybylski, Frank J., 4,009,372.
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Hooper, Clinton; Miciukiewicz, Joseph F.; Pollak, Philip, Jr.; and Bach, John W., to Pitney-Bowes, Inc. Master loading and unloading apparatus for a lithographic printing machine. 4,008,660, Cl. 101-132.000.
Hoosic, Thomas Paul: *See*—
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Hope Kabushiki Kaisha: *See*—
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Hopfer, Samuel, to General Microwave Corporation. Variable microwave attenuator. 4,009,456, Cl. 333-81.00A.
Hopp Press, Inc., The: *See*—
Greenberger, William, 4,008,533.
Hopwood, Francis W.; and Staley, Lester K., to Westinghouse Electric Corporation. Phase lock loop for a voltage controlled oscillator. 4,009,448, Cl. 331-4.000.
Horiuchi, Tomio: *See*—
Kojima, Tamotsu; Sato, Shui; Endo, Takaya; Usui, Tugumoto; and Horiuchi, Tomio, 4,009,035.
Hort, Eugene V., to GAF Corporation. Photoconductive polymer and method of manufacture. 4,009,326, Cl. 526-47.000.
Horvay, Julius B., to General Electric Company. Apparatus for heat control of a refrigeration system. 4,008,579, Cl. 62-183.000.
Hosokawa, Masao: *See*—
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Hosotani, Masanobu: *See*—
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Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: *See*—
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Howard, Alan Norman. Methods and formulations for the treatment of obesity. 4,009,265, Cl. 424-177.000.
Howell, Robert G.: *See*—
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Howmet Corporation: *See*—
Biebuyck, Lawrence F., 4,008,552.
Hreha, Frank. Water to fuel converter. 4,009,006, Cl. 23-281.000.
Huber, Bernhard Werner; and Tamm, Rolf Gunther Arnold, to Bodenseewerk Perkin-Elmer & Co. GmbH. Method of and device for the analysis of samples by means of flameless atomic absorption spectroscopy. 4,008,963, Cl. 356-85.000.
Huber, Wolfgang; Saifer, Mark G.; and Williams, Lewis D., to Diagnostic Data, Inc. Cross-linked orgotein. 4,009,267, Cl. 424-177.000.
Hudson, John W.; and Pendergrast, Robert A., to United States Steel Corporation. Process for the manufacture of monoammonium phosphate. 4,009,245, Cl. 423-313.000.
Hudson, Sharon J., Jr., to Sharon Manufacturing Company. Suction accumulator. 4,008,581, Cl. 62-503.000.
Hufford, Jerrold L., to Armer Construction Company. Apparatus for air conditioning employing variable terminal box. 4,008,756, Cl. 165-26.000.
Hugelin, Bernard: *See*—
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Hunt, Thomas, to BP Chemicals International Limited. Filling compounds. 4,009,145, Cl. 260-40.00R.
Hurst, Doug; and Mowatt-Larssen, Erling, to General American Transportation Corporation. Drop center tank. 4,008,739, Cl. 141-35.000.
Hutchinson, Marvin E., Jr. Reagent and method for determination of phosphorous. 4,009,004, Cl. 23-230.00B.
Hybrid Systems Corporation: *See*—
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Ide, Allan R. Load unitizer. 4,008,916, Cl. 294-67.00R.
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Imada, Akira: *See*—
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Inariba, Tokuzo. Synchronous micromotor with a permanent magnet rotor. 4,009,406, Cl. 310-164.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
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Institut po Metaloznanie i Technologia na Metalite: *See*—
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Ishigaki, Yukinobu; and Fukui, Kiyotake, to Matsushita Electric Industrial Co., Ltd.; and Victor Company of Japan, Limited. Phase locked loop angle modulation system with large modulation index. 4,009,455, Cl. 332-18.000.
Ishiguro, Kazuhiko: *See*—
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Itoh, Yoshimasa, to Matsushita Electric Industrial Co., Ltd. Electrolytic capacitor having a conductive graphite particles layer between organic solid electrolyte and cathode. 4,009,424, Cl. 361-433.000.
ITT Industries, Inc.: *See*—
Nguyen Dat, Nhiep; Bensoussan, Maurice; and Doucet, Bernard, 4,009,408.
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; and Uchidoi, Masanori, to Canon Kabushiki Kaisha. Roll film camera for use with various sized magazines. 4,009,480, Cl. 354-210.000.
Izumi, Yusuke; Miyazaki, Hidetaka; and Kawahara, Shin-ichi, to Tokuyama Soda Kabushiki Kaisha. Process for preparing hydrogen peroxide. 4,009,252, Cl. 423-584.000.
J. M. Richards Laboratories: *See*—
Nyboer, Jan, 4,008,712.
Jackson, Calvin E. Glow plug connector. 4,008,944, Cl. 339-253.00R.
Jager, Horst: *See*—
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Jakobi, Wilhelm, to Maschinenfabrik Fahr Aktiengesellschaft Gottmadingen. Shaker for harvester-thresher. 4,008,722, Cl. 130-26.000.
James B. Carter Limited: *See*—
Danell, Russell D., 4,009,366.
James, Randell Leland; and Padden, James Thomas, to International Business Machines Corporation. Analog signal detection. 4,009,353, Cl. 179-84.0VF.
Janes, George Sargent; Levy, Richard H.; and Levin, Lawrence A., to Jersey Nuclear-Avco Isotopes, Inc. Suppression of unwanted lasing in laser isotope separation. 4,009,391, Cl. 250-281.000.
Japan Exlan Company Limited: *See*—
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Jardine, Douglas M. Underground storage system for heating and cooling systems. 4,008,709, Cl. 126-271.000.
Jasinski, Raymond J.: *See*—
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Jensen, Bruce E.; and Tolar, Jimmie G., to Air Products and Chemicals, Inc. Solvent cleaning and recovery process. 4,009,048, Cl. 134-12.000.
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Jensen, Harald: *See*—
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Jeris, John S., to Ecolotrol, Inc. Waste treatment process. 4,009,098, Cl. 210-3.000.
Jeris, John S., to Ecolotrol, Inc. Apparatus and process for removing ammonia nitrogen from waste water. 4,009,099, Cl. 210-3.000.
Jeris, John S., to Ecolotrol, Inc. Waste treatment apparatus. 4,009,105, Cl. 210-107.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
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Johansson, Hans Arne Valentin. Automated bathing plant. 4,008,496, Cl. 4-145.000.
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John Wyeth & Brother Limited: *See*—
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Johnson, Lauren L., to General Motors Corporation. Series parallel transition for power supply. 4,009,431, Cl. 322-7.000.
Johnson, Lavell R., to Becton, Dickinson and Company. Apparatus for radioimmunoassay with regeneration of immunadsorbent. 4,009,005, Cl. 23-253.00R.
Johnson, Patrick Steven. Butter dispenser. 4,008,681, Cl. 118-5.000.
Johnson, Richard Shaw: *See*—
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Johnson, Robert L., to United States Steel Corporation. Saw blade handling device. 4,008,817, Cl. 214-147.00R.
Johnson, Roy A.: *See*—
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Johnsson, Lars Bertil, to Societe anonyme dite Etablissement GENOUD & Cie. Valve system, particularly for cigarette lighter. 4,008,992, Cl. 431-344.000.
Jones, James E., to PPG Industries, Inc. Electrodepositable epoxy resins having quaternary groups carrying blocked NCO, and aqueous dispersions. 4,009,133, Cl. 260-29.2TN.
Jones, John Wyn, to International Business Machines Corporation. Dynamic associative cell. 4,009,472, Cl. 340-173.00R.
Jones, Stanley Peter, to Emhart (U.K.) Limited. Systems for transferring heat through a glassware forming mold. 4,009,017, Cl. 65-162.000.
Jorgensen, Povl Jorgen, to Rotostat I/S. Mixing unit for mixing and/or treating fluid materials. 4,008,882, Cl. 259-2.000.
Jos. Schneider & Co. Optische Werke Kreuznach: *See*—
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Jungesjo, Harald N.: *See*—
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Juto, Yasuro; and Suzuki, Keisuke, to Yamaha, Hatsudoki Kabushiki Kaisha. Compact snowmobile. 4,008,777, Cl. 180-5.00R.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
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Kalev, Lyubomir Tzonev; Zikov, Kostadin Zikov; and Marvakov, Ivan Kirilov, to Institut po Metaloznanie i Technologia na Metalite. Pulsed-DC arc welding. 4,009,365, Cl. 219-135.000.
Kali-Chemie Aktiengesellschaft: *See*—
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Kallin, Karl Ake; Larcen, Jan August; and Meyer, Waldemar, to Atlas Copco Aktiebolag. Method and a machine for advancing an underground face of a geological formation. 4,008,922, Cl. 299-13.000.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyme dite: L'Oreal. N,N-dialkylamino diphenylamines for dyeing keratinic fibers. 4,008,999, Cl. 8-10.200.
Kalopissis, Gregoire; and Vanlerberghe, Guy, to Societe Anonyme dite: L'Oreal. Hair treating compositions containing cationic surface active agents. 4,009,255, Cl. 424-70.000.
Kam, Ting Yuet: *See*—
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Karpov, Oleg Stepanovich: *See—*
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Katsuta, Kihei, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of making insulated tank for low temperature service. 4,009,236, Cl. 264-45.300.
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Katz, Sherwin D., to I-T-E Imperial Corporation. Counterbalance valve. 4,008,731, Cl. 137-106.000.
Katzman, Frederick. In-ground swimming pool. 4,008,547, Cl. 52-169.700.
Kaufman, Samuel. Device for setting sockets for swimming pool ladders. 4,008,550, Cl. 52-298.000.
Kaupmann, Wilhelm; von Eickstedt, Klaus-Wolf; and Rahman, Salah-Eldin, to Kali-Chemie Aktiengesellschaft. Amino carbonyl derivatives of benzofurans, processes for their production, and pharmaceutical compositions containing the same 2-phenyl-3-[3-dialkylaminopropanoyl]benzofuran compounds. 4,009,184, Cl. 260-346.20R.
Kawabata, Hidetoshi: *See—*
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Kawase, Buntaro; Kojima, Iwao; Kasai, Juichi; and Kawasaki, Keiji, to Showa Denko Kabushiki Kaisha. Method of removing mercury vapor from gases contaminated therewith. 4,009,241, Cl. 423-210.000.
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Kayser, Lutz Tilo. Clearing of land mines. 4,008,644, Cl. 89-1.00M.
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Lob, Georg; and Pfohler, Clemens, to Brown, Boveri & Cie. A.G. Method for producing the insulation of a conductor bundle. 4,009,296, Cl. 427-54.000.

Lobisch, Gunter: *See*—
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Loewenhardt, Hubert H.: *See*—
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Long, Jamesina: *See*—
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Long, William J., to United States Gypsum Company. Gypsum wallboard — making process and product. 4,009,062, Cl. 156-39.000.

Longman, Millard D., Jr.: *See*—
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Love, Gordon R., to Union Carbide Corporation. Ultrasonic testing of multilayer ceramic capacitors. 4,008,602, Cl. 73-67.80R.

Lovell, James Byron: *See—*
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Lowe, Clovis Carroll, Jr., to Atlantic Richfield Company. Well treatment method. 4,008,763, Cl. 166-253.000.

Lowther, Frank Eugene, to W. R. Grace & Co. Method for operating a gaseous discharge lamp with improved efficiency. 4,009,416, Cl. 315-176.000.

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Luce, Nunzio A.; and Zanoni, Louis A. Liquid crystal display device. 4,008,564, Cl. 58-23.00R.

Luch, Daniel, to International Nickel Company, Inc., The. Platable polymeric composition. 4,009,093, Cl. 204-291.000.

Luckenbach, Edward C., to Exxon Research and Engineering Company. Method of temperature control in catalyst regeneration. 4,009,121, Cl. 252-417.000.

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Luhleich, Hartmut; Nickel, Hubertus; Pflaum, Peter; and Dias, Francesco, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for producing carbonaceous substances for use in synthetic-graphite and graphite-like bodies. 4,009,143, Cl. 260-38.000.

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Lummus Company, The: *See—*
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Luna, Jerry Martin. Protective reflective helmet. 4,008,949, Cl. 350-98.000.

Lundberg, George A., to E. J. Brooks Company. Locking cover for meter clamping ring. 4,008,585, Cl. 70-164.000.

Lutz, Erno B., to Solfan Security Systems. Apparatus for automatically controlling door operation. 4,009,476, Cl. 343-7.0ED.

Lyon, George W.; and Pearce, Roscoe L., to Dow Chemical Company, The. Regeneration of liquid desiccants and acid gas absorbing liquid desiccants. 4,009,083, Cl. 203-49.000.

Lyons, Bernard J., to Raychem Corporation. Composition of antioxidants of reduced volatility. 4,009,147, Cl. 260-45.95B.

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MacMaster, Malcolm D., to Emhart Industries, Inc. Temperature averaging device. 4,008,615, Cl. 73-343.00R.

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Mahlein, Hans: *See—*
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Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Phenoxypropylamine derivatives. 4,009,275, Cl. 424-267.000.

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Masaki, Mitsuo; Matsunami, Satoshi; Kita, Jyunichiro; and Hayashi, Toshikazu, to UBE Industries, Ltd. Pyridinethiol-tin compound and process for the preparation of the same. 4,009,168, Cl. 260-270.00K.

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Massoth, Franklin E.; and Young, John E., Jr., to Gulf Research & Development Company. Process for reducing the COS content of gaseous hydrocarbon streams by use of supported lead oxide. 4,009,009, Cl. 55-73.000.
Masuda, Takao; and Sekikawa, Nobuyoshi, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive oxazoline containing element. 4,009,039, Cl. 96-114.100.
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May, Joseph N., to Xerox Corporation. Dry film processing. 4,009,034, Cl. 96-48.0HD.
Mayer, Karl, to Maschinenfabrik Augsburg-Nurnberg AG. Crank shaft welded together from individual elements. 4,008,927, Cl. 308-23.000.
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Meshberg, Philip. Liquid dispenser using a non vented pump and a collapsible plastic bag. 4,008,830, Cl. 222-95.000.
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Miller, Floyd V., to Sperry Rand Corporation. Time expander circuit for a frequency-to-digital converter. 4,009,402, Cl. 307-267.000.
Miller, Frederick O., to Miller Mold Company. Die assembly for forming openings in workpieces. 4,008,638, Cl. 83-185.000.
Miller, Harry C.; and Tickel, Herman Edward, Jr., to Tickel, H. Edward, Jr.; and Miller, Harry C., part interest to each. Rotary plug cylinder lock construction. 4,008,588, Cl. 70-366.000.
Miller, Jimmy L.; Salkin, Burton; Schnell, William J.; and Wolf, Ludwig, Jr., to Baxter Laboratories, Inc. Multi-level support member for use with semipermeable membrane. 4,009,107, Cl. 210-321.00B.
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Mizutani, Akihiro, to Meito Sangyo Kabushiki Kaisha. Complexes of polysaccharides or derivatives thereof with reduced glutathione and process for preparing said complexes. 4,009,264, Cl. 424-177.000.

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Mohr, Reinhard: *See—*
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Moll, Manfred; Durand, Gilbert; and Blachere, Henri, to Groupement d'Interet Economique. Continuous production of fermented liquids. 4,009,286, Cl. 426-13.000.

Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, to Polysius AG. Rotary kiln construction. 4,008,995, Cl. 432-80.000.

Moltgen, Gottfried, to Siemens Aktiengesellschaft. Method and apparatus for compensating reactive power. 4,009,433, Cl. 323-102.000.

Monahan, Michael A.: *See—*
Bocker, Richard P.; Bromley, Keith; Monahan, Michael A.; and Stotts, Larry B., 4,009,380.

Monfret, Alain Gerard: *See—*
de Brebisson, Michel; Monfret, Alain Gerard; and Decrouen, Jean-Michel, 4,009,057.

Monn, Walter. Rotary cycling valve for internal combustion engines. 4,008,694, Cl. 123-41.400.

Monsanto Company: *See—*
Bartram, Ronald D.; and Runkle, Charles J., 4,008,597.
Fishel, Norman A., 4,009,185.
Schleppnik, Alfred A.; and Vanata, Steve G., 4,009,253.

Montedison Fibre S.p.A.: *See—*
Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, 4,009,183.

Montigny, Joseph W. Reflective pavement marker. 4,008,973, Cl. 404-16.000.

Moore, Brian Barry: *See—*
Boudreau, Paul Emile; and Moore, Brian Barry, 4,009,469.

Moore, Edward B.; and Ryan, Donald P., to Edo-Aire, a Division of Edo Corporation. Frequency range selectable oscillator for multichannel communication system. 4,009,451, Cl. 331-64.000.

Moorhouse, Walter: *See—*
Denney, Joe W., 4,008,632.

Morbitzer, Leo: *See—*
Ott, Karl-Heinz; Rohr, Harry; Humme, Gert; and Morbitzer, Leo, 4,009,227.

Morelli, Robert T., to Crucible Inc. Low permeability, nonmagnetic alloy steel. 4,009,025, Cl. 75-123.00B.

Mori, Tamiki: *See—*
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsahide; Mori, Tamiki; and Yasutomi, Yasuo, 4,009,206.

Morman, James Forrester: *See—*
Borthwick, James; and Morman, James Forrester, 4,008,723.

Mormann, Werner; and Wagner, Kuno, to Bayer Aktiengesellschaft. Diisocyanato-diketenes. 4,009,152, Cl. 260-77.5AT.

Morton-Norwich Products, Inc.: *See—*
Orelup, Richard B., 4,009,008.
Schwan, Thomas J.; Davis, Charles S.; and Honkomp, LeRoy J., 4,009,177.

Moskovich, Peter P., to Atlantic Richfield Company. Liquid dispensing nozzle assembly and method of using same. 4,008,738, Cl. 141-5.000.

Moss, Jack N.: *See—*
De Benneville, Peter L.; Moss, Jack N.; and Dajani, Esam Z., 4,009,284.

Motomura, Toshiharu: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Miyata, Satoru; and Ide, Hiroyuki, 4,009,166.

Motorola, Inc.: *See—*
Clark, Lowell E., 4,009,483.
Dattilo, Donald J., 4,008,841.
Flowers, Dervin L.; and Greeson, Richard L., 4,009,299.
Gartner, Todd Henry, 4,008,698.
Holcomb, Don R.; and Kline, Arthur J., Jr., 4,009,450.
Rozylowicz, Edward Francis, 4,009,477.

Mott, Roger Eugene, to Deere & Company. Adjustable reel for a harvester platform. 4,008,558, Cl. 56-226.000.

Mount Sinai School of Medicine of the City University of New York, The: *See—*
Kilbourne, Edwin D., 4,009,258.

Mowatt-Larssen, Erling: *See—*
Hurst, Doug; and Mowatt-Larssen, Erling, 4,008,739.

Mugnaini, Fernando. Transport device for movement of an operator up and down a utility pole. 4,008,785, Cl. 182-133.000.

Mulder, Cornelis; and Wulms, Henricus Elisabeth Jozef, to U.S. Philips Corporation. Logic circuit. 4,009,397, Cl. 307-203.000.

Muller, Eberhard: *See—*
Harreus, Albrecht; Muller, Eberhard; and Schultz, Gerhart, 4,009,135.

Mullersman, Ferdinand H., to General Electric Company. Charger with multiple attachable cellholder modules. 4,009,429, Cl. 320-2.000.

Mundlos, Eberhard; Mohr, Reinhard; and Herz, Luis, to Hoechst Aktiengesellschaft. Basic oxazine dyestuffs. 4,009,162, Cl. 260-245.000.

Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsahide; Mori, Tamiki; and Yasutomi, Yasuo. N-(substituted phenyl and benzyl)abietamides. 4,009,206, Cl. 260-557.00B.

Muraishi, Masakazu, to Nissan Motor Co., Ltd. Tiltable seat latch devices. 4,008,919, Cl. 297-331.000.

Murakami, Noboru; and Hirosawa, Koichiro, to Aisin Seiki Kabushiki Kaisha. Fluid pressure control system for automatic transmissions. 4,008,630, Cl. 74-865.000.

Murakami, Shigeo: *See—*
Shinohara, Hiroshi; Masunaga, Kunihiko; Murakami, Shigeo; and Ishiguro, Kazuhiko, 4,008,692.

Muranaka, Takayoshi; Yoneda, Hajime; and Miyazaki, Yoshio, to Matsushita Electric Industrial Co., Ltd. Capacitor with intersecting lead plates. 4,009,425, Cl. 317-230.000.

Murasaki, Hiroshi: *See—*
Ogawa, Masaya; Enoguchi, Yuji; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 4,008,954.

Murata, Masahiro, to Hope Kabushiki Kaisha. Heel pieces of ski bindings. 4,008,907, Cl. 280-614.000.

Murayama, Masao: *See—*
Tanabe, Osamu; Obayashi, Akira; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Matsumura, Shingo, 4,009,077.

Murdoch, Peter. Machine tools. 4,008,886, Cl. 269-266.000.

Murray, Keith William: *See—*
Green, Robin John; Key, Michael David; and Murray, Keith William, 4,009,076.

Murray, Thomas P., to United States Steel Corporation. Scanning pyrometer. 4,008,616, Cl. 73-355.00R.

Musch, Bernard E., to Hewlett-Packard Company. Portable programmable calculator displaying absolute line number addresses and key codes and automatically altering display formats. 4,009,379, Cl. 235-156.000.

Muse, Joel: *See—*
Tazuma, James J.; and Muse, Joel, 4,009,228.

Myers, Donald M., to Ludlow Industries, Inc. Vibratory bin level indicators. 4,008,613, Cl. 73-290.00V.

Naarden International, N.V.: *See—*
Roos, Robert; and Kuhn, Peter J., 4,009,289.

Nagami, Minoru: *See—*
Kimura, Takashi; Kawashima, Giichi; Nagami, Minoru; and Hanada, Minoru, 4,009,237.

Nagano, Kentaro; Henmi, Ichiro; and Kiyota, Masahiro, to Asahi Glass Co., Ltd. Apparatus for sealing tubes. 4,008,843, Cl. 228-33.000.

Nagaoka, Tateki; Kimura, Yoshimasa; and Komiya, Yutaka, to Canon Kabushiki Kaisha. Liquid quantity detecting device. 4,008,612, Cl. 73-290.00R.

Nagasawa, Hideo: *See—*
Kimura, Shiro; Nagasawa, Hideo; Kato, Yasuo; Nakamura, Yasuyoshi; Miki, Shoji; and Ishikawa, Yumiko, 4,009,205.

Nagel, Otto: *See—*
Hess, Klaus; Stickel, Richard; Nagel, Otto; Sinn, Richard; and Daucher, Hans, 4,009,100.

Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Feldgun, Leon Izrailevich; Drui, Mark Simonovich; Kostjuk, Boris Dmitrievich; Zjukin, Nikolai Stepanovich; Lysanov, Vladislav Sergeevich; and Lavrinovich, Alla Alexandrovna. Alloy for metallization and brazing of abrasive materials. 4,009,027, Cl. 75-154.000.

Nakagawa, Akira: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Miyata, Satoru; and Ide, Hiroyuki, 4,009,166.

Nakagawa, Jihei, to Olympus Optical Co., Ltd. Retrofocus-type lens system. 4,008,952, Cl. 350-215.000.

Nakaguti, Osamu: *See—*
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,009,159.

Nakamura, Hitoshi: *See—*
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,009,159.

Nakamura, Matsuaki: *See—*
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.

Nakamura, Teruya: *See—*
Tanabe, Osamu; Obayashi, Akira; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Matsumura, Shingo, 4,009,077.

Nakamura, Yasuo: *See—*
Umemura, Sumio; Ohdan, Kyoji; Matsuzaki, Tokuo; Nakamura, Yasuo; and Sawazi, Masao, 4,009,194.

Nakamura, Yasuyoshi: *See—*
Kimura, Shiro; Nagasawa, Hideo; Kato, Yasuo; Nakamura, Yasuyoshi; Miki, Shoji; and Ishikawa, Yumiko, 4,009,205.

Nakano, Isamu: *See—*
Kobayashi, Mikio; and Nakano, Isamu, 4,009,069.

Nakano, Seizo: *See—*
Kishi, Tuneo; Itoh, Hiroshi; Tamura, Masaoki; Nakano, Seizo; and Hosokawa, Masao, 4,009,458.

Nakao, Masaaki: *See—*
Shiiki, Zenya; Nakao, Masaaki; and Katori, Kunihiko, 4,009,232.

Nakao, Masaru: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,009,275.
Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, 4,009,173.

Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Reverse conducting thyristor and process for producing the same. 4,009,059, Cl. 148-187.000.

Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor thermally sensitive switch structure. 4,009,482, Cl. 357-28.000.

Narato, Kiyoshi; Ootsuka, Keizo; and Sawahata, Syoichi, to Hitachi, Ltd. Sampler for analyzers. 4,008,620, Cl. 73-421.50A.

Narrace, John M.: *See—*
Silva, Jose R.; and Narrace, John M., 4,008,714.

Nath, Gunther. Flexible light guide, particularly for medical/dental use. 4,009,382, Cl. 240-1.0LP.

National Research Development Corporation: *See—*
Cavendish, Michael Edward; and Elloy, Martin Arthur, 4,008,495.

National Starch and Chemical Corporation: *See—*
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Legato, Gerard J., 4,009,256.
Schoenberg, Jules E., 4,009,311.

Naumann, Gunter: *See—*
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,009,116.

Nawrot, Charles F.: *See—*
Crawford, George H.; Nawrot, Charles F.; and Ofstead, Ronald F., 4,009,313.

Naylor, Herbert C., to Oak Industries Inc. Anti-static keylock switch. 4,009,357, Cl. 200-42.00R.

NCR Corporation: *See—*
Fassbender, Charles J., 4,009,490.

Nebe, William John, to Du Pont de Nemours, E. I., and Company. Hexaarylbiimidazole polymers. 4,009,040, Cl. 96-115.00R.

Nebelung, Hermann; and Christopher, Edward Charles, to Emhart Industries, Inc. Glassware forming machine of the I. S. type with in-line mold motion. 4,009,018, Cl. 65-229.000.

Nedelec, Lucien; and Frechet, Daniel, to Roussel-UCLAF. Substituted 10,11-dihydro-5,10-imino-[5H] dibenzo (a,d)-cycloheptene. 4,009,273, Cl. 424-258.000.

Nedenskov, Poul: *See—*
Eliasson, Rune; and Nedenskov, Poul, 4,009,187.

Neely, Allan B., Jr. Haystacking and reloading tailgate apparatus. 4,008,818, Cl. 214-505.000.

Neis, Thomas W.: *See—*
Grimes, Terrence L.; and Neis, Thomas W., 4,009,464.

Nekrasov, Boris Vladimirovich: *See—*
Novozhilov, Vasily Nikolaevich; Nekrasov, Boris Vladimirovich; Semenov, Pavel Alexeevich, deceased; Semenova, Vera Vasilievna, administratrix; Semenova, Irina Pavlovna, administratrix; and Semenov, Sergei Pavlovich, administrator, 4,009,250.

Nell, Kuno, to Knorr-Bremse GmbH. Uncoupling device for central buffer couplings on railroad vehicles. 4,008,811, Cl. 213-211.000.

Nelson, Robert C., to West Virginia Armature Co., Inc. Mining machine conveyor with deflectible boom. 4,008,797, Cl. 198-318.000.

Neo Filter Co., Ltd.: *See—*
Ainoya, Koh; Arai, Kiichi; Kato, Akira; and Tanaka, Michio, 4,008,555.

Nepper, Robert F., to Minnesota Mining and Manufacturing Company. Color printing method. 4,008,962, Cl. 355-77.000.

Neuray, Dieter; Tresper, Erhard; and Freitag, Dieter, to Bayer Aktiengesellschaft. High molecular weight polycarbonates of $\alpha,\alpha,\alpha,\alpha'$-$\alpha'$-hexakisaryl-1,3-and/or -1,4-dimethyl benzenes. 4,009,148, Cl. 260-47.0XA.

Newingham, Thomas D.; and Recchuite, Alexander D., to Sun Oil Company of Pennsylvania. Method of making invert water-in-oil emulsion. 4,009,117, Cl. 252-309.000.

Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Plasma panel with dynamic keep-alive operation utilizing a lagging sustain signal. 4,009,415, Cl. 315-169.0TV.

Nguyen Dat, Nhiep; Bensoussan, Maurice; and Doucet, Bernard, to ITT Industries, Inc. High-pressure sodium-vapor discharge lamp. 4,009,408, Cl. 313-198.000.

Nicholas, Dimitri P. Pet bed. 4,008,688, Cl. 119-1.000.

Nichols, Frank S.; Bliss, Charles H.; and Londergan, Robert J., to General Electric Company. Electrical insulating compositions of epoxy resins, zirconium silicate and alumina. 4,009,141, Cl. 260-37.0EP.

Nickel, Hubertus: *See—*
Luhleich, Hartmut; Nickel, Hubertus; Pflaum, Peter; and Dias, Francesco, 4,009,143.

Niedermeier, Karl; and Wintzer, Manfred, to Siemens Aktiengesellschaft. Process for the production of ceramic substrates for thin layer circuits. 4,009,238, Cl. 264-61.000.

Niederst, Ken W.: *See—*
Erikson, J. Alden; and Niederst, Ken W., 4,009,307.

Ninomiya, Nobutaka: *See—*
Numasaki, Kouichi; Ninomiya, Nobutaka; Matsumoto, Zenji; Adachi, Kiyoshi; and Fujimoto, Toyohisa, 4,008,994.

Nippon Kokan Kabushiki Kaisha: *See—*
Ueda, Takeshi; Koizumi, Kunihei; Otani, Tatsu; and Hironaka, Shun-ichi, 4,009,081.

Nippon Oil Company Ltd.: *See—*
Tadashi, Zenbutsu; Hajime, Asami; Seiichi, Uemura; and Takao, Hirose, 4,009,308.

Nippon Shinyaku Co., Ltd.: *See—*
Tanabe, Osamu; Obayashi, Akira; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Matsumura, Shingo, 4,009,077.

Nippondenso Co., Ltd.: *See—*
Ooiwa, Katsuhiko; Ito, Shigehiko; and Maeda, Shinichi, 4,008,607.

Nissan Motor Co., Ltd.: *See—*
Harada, Masanori, 4,008,570.
Hisatomi, Takashi, 4,008,696.
Konno, Mitsutaka, 4,008,697.
Muraishi, Masakazu, 4,008,919.
Otani, Syuichi; and Matsuoka, Hideoki, 4,008,909.

Nissen Corporation: *See—*
Nissen, George P., 4,008,892.

Nissen, George P., to Nissen Corporation. Apparatus for rebound running. 4,008,892, Cl. 272-100.000.

Nisshin Seiyu Kabushiki Kaisha: *See—*
Okumori, Toshio; Tadokoro, Yozo; Takagi, Yoshiyuki; and Yoshida, Nobuo, 4,009,290.

Nitzki, Leopold; and Alsen, Jurgen, to Aktiengesellschaft "Weser". Catamaran vessel. 4,008,674, Cl. 114-61.000.

Nobusawa, Tsukumo, to Asahi Optical Co., Ltd. Method and device tor use in detecting a precise focusing point. 4,008,965, Cl. 356-125.000.

Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Miyata, Satoru; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Pyrido(2,3-d) pyrimidinones. 4,009,166, Cl. 260-256.40F.

Nodera, Katsuji: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.

Noehren, William Lawrence; and Hibyan, Edward Stanley, to United Technologies Corporation. Composite helicopter spar and means to alleviate stress concentration. 4,008,980, Cl. 416-134.00A.

Nolan, John T., Jr.: *See—*
Cole, Edward L.; and Nolan, John T., Jr., 4,009,094.

Noma, Takashi; Fujie, Hiroshi; and Ozawa, Shuji, to Teijin Limited. Process for preparing aromatic polyamides with sodium carbonate hydrate as acid acceptor. 4,009,154, Cl. 260-78.0SC.

Noonan, Charles M., to Westinghouse Electric Corporation. Thin film electrostatic epoxy coating powder. 4,009,223, Cl. 260-830.0TW.

Norco, Inc.: *See—*
Malhotra, Surinder M., 4,008,625.

Nordischer Maschinenbau Rud. Baader: *See—*
Braeger, Horst; and Groth, Gerhard, 4,008,509.

Nordman, James Emery: *See—*
Cardinne, Philippe; Colomb, Francois; Manhes, Bernard; Nordman, James Emery; and Serve, Raymond, 4,009,479.

Norfin, Inc.: *See—*
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., 4,009,071.

Norling, Parry McWhinnie, to Du Pont de Nemours, E. I., and Company. Time-lapse free-radical polymerizable composition. 4,009,150, Cl. 260-63.0UY.

Northern Electric Company Limited: *See—*
Debortoli, George; and Chase, Peter McGivery, 4,009,340.

Northern Telecom Limited: *See—*
Dalgleish, Jack Frank; Lukas, Helmut Hans; and Charron, Louis Donald, 4,008,948.

Novozhilov, Vasily Nikolaevich; Nekrasov, Boris Vladimirovich; Semenov, Pavel Alexeevich, deceased; Semenova, Vera Vasilievna, administratrix; Semenova, Irina Pavlovna, administratrix; and Semenov, Sergei Pavlovich, administrator. Contact method of producing sulphuric acid. 4,009,250, Cl. 423-522.000.

Nowak, Frank A., Jr.; Micchelli, Albert L.; and Legato, Gerard J., to National Starch and Chemical Corporation. Novel shampoo composition containing a water-soluble cationic polymer. 4,009,256, Cl. 424-70.000.

Noyce, George, to Hartwell Corporation. Wire coiling machine. 4,008,594, Cl. 72-142.000.

NSC International Corporation: *See—*
Cutter, James W., 4,008,501.

Nudenberg, Walter: *See—*
Little, Julian R.; Nudenberg, Walter; and Rim, Yong S., 4,009,200.

Numasaki, Kouichi; Ninomiya, Nobutaka; Matsumoto, Zenji; Adachi, Kiyoshi; and Fujimoto, Toyohisa, to Japan Gasoline Co., Ltd.; and Takeda Chemical Industries, Ltd. Apparatus and method for regeneration of spent wet active carbon. 4,008,994, Cl. 432-14.000.

Nuovo Pignone, S.p.A.: *See—*
Vinciguerra, Costantino, 4,008,888.

Nuver, Eric L. H., to Esquire, Inc. Automatic energy control lighting system with automatically variable dc source. 4,009,387, Cl. 250-205.000.

Nyboer, Jan, to J. M. Richards Laboratories. Method for monitoring body characteristics. 4,008,712, Cl. 128-2.10Z.

O & K Orenstein & Koppel Aktiengesellschaft: *See—*
Brix, Joachim Emil, 4,008,676.

Oak Industries Inc.: *See—*
Naylor, Herbert C., 4,009,357.

Obayashi, Akira: *See—*
Tanabe, Osamu; Obayashi, Akira; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Matsumura, Shingo, 4,009,077.

Oberg, Karl Erik; and Sjoberg, Bengt Olof, to Uddeholms Aktiebolag. Method for the refining of molten metal. 4,009,023, Cl. 75-12.000.

Ochiai, Tsurunosuke. Automatic vehicle-speed adjusting device. 4,008,781, Cl. 180-104.000.

Oda, Shingo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Device for adjusting position of taker-in under casing in card. 4,008,511, Cl. 19-105.000.

Offerman, Sidney, to Grow Chemical Corporation. Sprayable decorative coating composition. 4,009,144, Cl. 260-40.00R.

Offermanns, Heribert: *See—*
vonBebenburg, Walter; and Offermanns, Heribert, 4,009,271.

Ofstead, Ronald F.: *See—*
Crawford, George H.; Nawrot, Charles F.; and Ofstead, Ronald F., 4,009,313.

Ogasawara, Shoji: *See—*
Kumagai, Tadashi; and Ogasawara, Shoji, 4,009,441.

Ogawa, Masaya; Enoguchi, Yuji; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, to Minolta Camera Kabushiki Kaisha. Device for extinguishing unnecessary electrostatic charge in electrophotographic copier. 4,008,954, Cl. 355-1.000.

Ogishima, Akira: *See—*
Sakai, Shigeo; Ogishima, Akira; Imada, Akira; Matsuno, Tetsuya; Suzuki, Kazuo; and Sugou, Susumu, 4,009,337.

Ogiue, Katumi; Ohta, Masaya; and Shibata, Shotaro, to Hitachi, Ltd. Integrated circuit isolation using gold-doped polysilicon. 4,009,484, Cl. 357-59.000.

Ohata, Katsuya: *See—*
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsahide; Mori, Tamiki; and Yasutomi, Yasuo, 4,009,206.

Ohdan, Kyoji: *See—*
Umemura, Sumio; Ohdan, Kyoji; Matsuzaki, Tokuo; Nakamura, Yasuo; and Sawazi, Masao, 4,009,194.

Ohi, Reiichi: *See—*
Arai, Atsuaki; Ohi, Reiichi; Yamada, Minoru; Yokoo, Kenji; and Hara, Hiroshi, 4,009,038.

Ohloff, Gunther; and Giersch, Wolfgang K., to Firmenich S.A. Oxatricyclo compounds useful as perfuming agents. 4,009,127, Cl. 252-522.000.

Ohta, Masaya: *See—*
Ogiue, Katumi; Ohta, Masaya; and Shibata, Shotaro, 4,009,484.

Okada, Hisao: Oyabe, Hideo; and Akita, Isao, to Sanyo Electric Co., Ltd. Radio receiver. 4,009,440, Cl. 325-335.

Okada, Yoshitsugu: *See—*
Yasuoka, Masahiro; and Okada, Yoshitsugu, 4,008,877.

Okawa, Tadayuki: *See—*
Yamada, Masatora; Tasaka, Shigeo; Okawa, Tadayuki; and Suzuki, Taichi, 4,008,858.

Okazaki, Saburo: *See—*
Kishimoto, Soichiro; and Okazaki, Saburo, 4,009,248.

Oki Electric Industry Company, Ltd.: *See—*
Sakai, Shigeo; Ogishima, Akira; Imada, Akira; Matsuno, Tetsuya; Suzuki, Kazuo; and Sugou, Susumu, 4,009,337.

Oku, Teruo: *See—*
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,009,159.

Okumori, Toshio; Tadokoro, Yozo; Takagi, Yoshiyuki; and Yoshida, Nobuo, to Nisshin Seiyu Kabushiki Kaisha. Method for preparing edible oil. 4,009,290, Cl. 426-489.000.

Okuno, Yoshitoshi, to Sumitomo Chemical Company, Limited. Fumigant composition containing d-allethronyl d-trans-chrysanthemate. 4,009,281, Cl. 424-306.000.

Olin Corporation: *See—*
Ardis, Alan E.; and Wojtowicz, John A., 4,009,182.
Cline, Warren K., 4,009,319.
Kilbourn, Lawrence Layton; and Brunkhorst, Robert, 4,008,532.
Lines, Ellwood L.; Herbst, John A.; and Fairbrother, Robert J., 4,009,122.

Olinger, Charles P.; and Wasserman, Jacob F., to Olinger, Charles P. Method and apparatus for non-invasive detection of intracranial aneurysms. 4,008,711, Cl. 128-2.00K.

Olinkraft, Inc.: *See—*
Poggiali, Lewis D., 4,008,804.

Oliver, Leland W.: *See—*
Anhalt, John W.; Goodman, David S.; and Oliver, Leland W., 4,008,938.

Oliver, Wayne H. Wall panel structure and connecting means therefor. 4,008,553, Cl. 52-584.000.

Olrik, Henrik Gerner. Friction drive device. 4,008,929, Cl. 308-176.000.

Olson, John E.; and Seaberg, Richard D., to Cascade Corporation. Sequence valve for clamping apparatus. 4,008,875, Cl. 251-63.400.

Olympus Optical Co., Ltd.: *See—*
Nakagawa, Jihei, 4,008,952.
Tsuda, Hiroshi; and Hayasaka, Toshimi, 4,008,946.

Ono, Keiichi: *See—*
Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, 4,009,173.

Ono Pharmaceutical Co., Ltd.: *See—*
Tsujino, Kazuaki; Kida, Junnosuke; Hosotani, Masanobu; Minamiura, Noshi; and Yamamoto, Takehiko, 4,009,079.

Onopchenko, Anatoli; and Schulz, Johann G. D., to Gulf Research & Development Company. Beta,beta-dialkylethylmercaptoethoxylate as new compounds. 4,009,211, Cl. 260-609.00R.

Ontario Research Foundation: *See—*
Smellie, Allan M.; and Brandstatter, Hans G., 4,009,247.

Ooba, Shigehiro: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.

Ooishi, Tadashi: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.

Ooiwa, Katsuhiko; Ito, Shigehiko; and Maeda, Shinichi, to Nippondenso Co., Ltd. Fuel consumption rate detecting apparatus. 4,008,607, Cl. 73-114.000.

Ootsuka, Keizo: *See—*
Narato, Kiyoshi; Ootsuka, Keizo; and Sawahata, Syoichi, 4,008,620.

Optograms, Inc.: *See—*
von Voros, Geza, 4,008,523.

Ora, Alpo Johannes: *See—*
Hampel, Hans Joachim; Eggersdorfer, Rolf; and Ora, Alpo Johannes, 4,009,088.

Orelup, Richard B., to Morton-Norwich Products, Inc. Colored water immiscible organic liquid. 4,009,008, Cl. 44-59.000.

Orme, Myrl E.: *See—*
Kluczynski, Matthew L.; and Orme, Myrl E., 4,008,737.

Orozovich, George E.: *See—*
Mitchell, William A.; Seidel, William C.; and Orozovich, George E., 4,009,291.

Orshansky, Elias, Jr., to Orshansky Transmission Corporation. Hydromechanical transmission. 4,008,628, Cl. 74-687.000.

Orshansky Transmission Corporation: *See—*
Orshansky, Elias, Jr., 4,008,628.

Osaka Gas Company, Ltd.: *See—*
Kurokawa, Masaharu; and Torii, Mitsuru, 4,009,080.

Ostojic, Nedeljko; and Boscak, Vladimir G., to Geo. A. Hormel & Co. Method and apparatus for sampling gas. 4,008,621, Cl. 73-421.50R.

Otani, Syuichi; and Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Actuator for safety seat belt system. 4,008,909, Cl. 280-746.000.

Otani, Tatsu: *See—*
Ueda, Takeshi; Koizumi, Kunihei; Otani, Tatsu; and Hironaka, Shun-ichi, 4,009,081.

Otsuka, Kouichi, to Kabushiki Kaisha Daini Seikosha. Counting or indicating ring device. 4,009,370, Cl. 235-64.000.

Ott, Karl-Heinz; Humme, Gert; Kranz, Dietmar; and Rohr, Harry, to Bayer Aktiengesellschaft. ABS moulding compositions. 4,009,226, Cl. 260-876.00R.

Ott, Karl-Heinz; Rohr, Harry; Humme, Gert; and Morbitzer, Leo, to Bayer Aktiengesellschaft. ABS moulding compositions. 4,009,227, Cl. 260-876.00R.

Otto, Hans-Peter: *See—*
Ehrich, Hans; Emshoff, Heiko; and Otto, Hans-Peter, 4,008,623.

Ou, Jan-Chou. Portable shoe shine apparatus. 4,008,504, Cl. 15-258.000.

Overhead Door Corporation: *See*—
Bailey, Morris W., 4,008,745.

Owczarski, William A.: *See*—
Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,008,844.

Owens-Corning Fiberglas Corporation: *See*—
Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., 4,009,317.

Owens-Illinois, Inc.: *See*—
Heckman, Russell W.; Koluch, Joseph S.; and Rhoads, Roger R., 4,009,301.
McCollister, Howard L., 4,009,015.

Oyabe, Hideo: *See*—
Okada, Hisao; Oyabe, Hideo; and Akita, Isao, 4,009,440.

Ozaki, Toshiaki: *See*—
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.

Ozawa, Shuji: *See*—
Noma, Takashi; Fujie, Hiroshi; and Ozawa, Shuji, 4,009,154.

P. Ferrero & C. S.p.A.: *See*—
Dogliotti, Amilcare, 4,008,809.

Padden, James Thomas: *See*—
James, Randell Leland; and Padden, James Thomas, 4,009,353.

Paez, Stephen A.: *See*—
de Paez, Consuelo R.; and Paez, Stephen A., 4,008,806.

Pain, John Herbert, to John Waddington Limited. Method and apparatus for the formation of tubular containers from blanks. 4,008,651, Cl. 93-81.00R.

Panel Technology, Inc.: *See*—
Kupsky, George A., 4,009,407.

Pansini, Andrew L. Stain remover for swimming pools, apparatus and method. 4,009,049, Cl. 134-21.000.

Papa, Anthony Joseph; and Proops, William Robert, to Union Carbide Corporation. Copolymers of cyclic vinyl ethers and cyclic acetals. 4,009,129, Cl. 260-2.50F.

Paradyne Corporation: *See*—
Saliga, Thomas V., 4,009,336.

Paret, Giancarlo; and Cinelli, Ermanno, to Snam Progetti S.p.A. Process for the separation of diolefins from mixtures containing the same. 4,009,084, Cl. 203-53.000.

Park Chemical Co.: *See*—
Foreman, Robert W., 4,009,112.

Parker, Brian E.; and West, Lynn P., to International Business Machines Corporation. Distributional activity compression. 4,009,346, Cl. 179-15.0AQ.

Parsons, James C., to Combined Services, Incorporated. Photographic reproportioning system. 4,008,959, Cl. 355-84.000.

Partridge, Donald F. Antiparallel commutated inverter. 4,009,430, Cl. 321-45.00C.

Patentbureau Danubia: *See*—
Szucs, Laszlo; Tasnadi, Csaba; and Lindner, Istvan, 4,009,229.

Paul Ferd. Peddinghaus, Firma: *See*—
Einhaus, Albert; Gurnth, Rudi; and Klaus, Siegfried, 4,008,885.

Paul, James Leonard: *See*—
Stautzenberger, Adin Lee; and Paul, James Leonard, 4,009,003.

Paulissen, George T., to Shell Oil Company. Ultrasonic method and apparatus for measuring wall thickness of tubular members. 4,008,603, Cl. 73-67.80S.

Paulonis, Daniel F.: *See*—
Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,008,844.

Pauls, Kurt: *See*—
Lorenz, Horst; and Pauls, Kurt, 4,008,840.

Paust, Joachim; and Schumacher, Horst, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2(or 3)-Methyl-1-acetoxy-4-alkoxy (or phenoxy)-1,3-butadienes. 4,009,202, Cl. 260-488.0CD.

Paustian, John E.: *See*—
Sze, Morgan C.; and Paustian, John E., 4,009,214.

Pawlak, Joseph A.; and Bajer, Francis J., to Hooker Chemicals & Plastics Corporation. Antidegradant esters. 4,009,198, Cl. 260-475.00R.

Payne, Robert A.; Slobodzian, Gregory E.; Zielinski, Stanley A.; and Ravanesi, Ralph M., to Stewart-Warner Corporation. Gray scale display system employing digital encoding. 4,009,335, Cl. 358-240.000.

Payne, Thomas F.: *See*—
Sauer, Philip D.; and Payne, Thomas F., 4,009,010.

Pearce, Roscoe L.: *See*—
Lyon, George W.; and Pearce, Roscoe L., 4,009,083.

Pearson, James M.; and Yanus, John F., to Xerox Corporation. Polymers of 2-vinyl-fluorenone and derivatives thereof. 4,009,151, Cl. 260-63.00K.

Peat, Marwick and Partners: *See*—
White, Howard S.; and Casciato, Leonard, 4,009,375.

Pendergrast, Robert A.: *See*—
Hudson, John W.; and Pendergrast, Robert A., 4,009,245.

Pennwalt Corporation: *See*—
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 4,009,157.

Perucca, Giovanni: *See*—
Belforte, Piero; and Perucca, Giovanni, 4,009,349.

Petri, Peter H., to Godchaux-Henderson Sugar Co., Inc. Continuous crystallization process and apparatus. 4,009,045, Cl. 127-16.000.

Petrie, Henry W. Universally adjustable forced air fireplace heater. 4,008,704, Cl. 126-121.000.

Petrillo, Vincent Carmen, to General Electric Company. Motive fluids for external combustion engines. 4,008,573, Cl. 60-651.000.

Petro-Tex Chemical Corporation: *See*—
McFarland, Cecil G., 4,009,126.

Petrov, Radoslav Stanev; Zahariev, Stefan Elenkov; Markov, Ivan Kirilov; and Peychev, Georgi Vassilev, to DSO "Montagi". Apparatus for transforming the cross-section of a thin-walled cylinder. 4,008,596, Cl. 72-176.000.

Peychev, Georgi Vassilev: *See*—
Petrov, Radoslav Stanev; Zahariev, Stefan Elenkov; Markov, Ivan Kirilov; and Peychev, Georgi Vassilev, 4,008,596.

Pfizer Inc.: *See*—
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Pflaum, Peter: *See*—
Luhleich, Hartmut; Nickel, Hubertus; Pflaum, Peter; and Dias, Francesco, 4,009,143.

Pfohler, Clemens: *See*—
Lob, Georg; and Pfohler, Clemens, 4,009,296.

Phillips, Geoff. Display device particularly suitable for shoes. 4,008,807, Cl. 211-34.000.

Phillips Petroleum Company: *See*—
Carter, Cecil O., 4,009,221.
Walker, John H., 4,009,295.
Witt, Donald R., 4,009,327.

Piccolini, Richard J.: *See*—
Leister, Norman A.; and Piccolini, Richard J., 4,009,195.

Pierce, Robert E., to Westinghouse Electric Corporation. Electrostatic fluidized bed build control. 4,008,685, Cl. 118-629.000.

Pierlot, Michel, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Fuel feed device for internal combustion engine. 4,008,700, Cl. 123-139.0AW.

Pierrel, Michel: *See*—
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,008,751.

Pierson, William M. Snow ski binding. 4,008,908, Cl. 280-636.000.

Pietsch, Hartmut; Clauss, Karl; Schmidt, Erwin; and Jensen, Harald, to Hoechst Aktiengesellschaft. 6-Methyl-2H-1,3-oxazin-2,4(3H)dione-3-sulfohalides. 4,009,161, Cl. 260-244.00R.

Pinier, Gaston: *See*—
Cabet, Alain; Pinier, Gaston; Semur, Pierre; and Roy, Marie-Annick, 4,009,350.

Pisio, Peter: *See*—
Anderson, Donald J.; Pisio, Peter; and Kirkvold, Charles F., 4,008,765.

Pitesky, Isadore. Liquid filtering and dispensing assembly. 4,008,718, Cl. 128-218.00R.

Pitney-Bowes, Inc.: *See*—
Dlugos, Daniel F.; and Manduley, Flavio M., 4,009,436.
Hooper, Clinton; Miciukiewicz, Joseph F.; Pollak, Philip, Jr.; and Bach, John W., 4,008,660.

Pitts, Marlene M.: *See*—
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Pitts, Paul F.: *See*—
Mattera, Henry A.; Pitts, Paul F.; and Pitts, Marlene M., 4,009,396.

Pizzolato, Giacomo: *See*—
Baggiolini, Enrico; Confalone, Pasquale Nicholas; Pizzolato, Giacomo; and Uskokovic, Milan Radoje, 4,009,172.

Plockl, Johann, to Erwin Sick Optik-Elektronik. Method of measuring the pitch of twisted threads. 4,008,964, Cl. 356-109.000.

Poggiali, Lewis D., to Olinkraft, Inc. Bathtub container and method. 4,008,804, Cl. 206-320.000.

Polaroid Corporation: *See*—
Carlson, David P.; Keenan, Thomas R.; and Marks, Douglas L., 4,009,031.
Greenwald, Richard B., 4,009,167.
Levy, Boris, 4,009,041.

Pollak, Philip, Jr.: *See*—
Hooper, Clinton; Miciukiewicz, Joseph F.; Pollak, Philip, Jr.; and Bach, John W., 4,008,660.

Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Hydroprocessing of hydrocarbons. 4,009,096, Cl. 208-111.000.

Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Acidic multimetallic catalytic composite. 4,009,123, Cl. 252-441.000.

Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,009,220, Cl. 260-673.500.

Polyakova, Antonina Mikhailovna: *See*—
Korshak, Vasily Vladimirovich; Polyakova, Antonina Mikhailovna; Mager, Kira Alexandrovna; and Semyantsev, Vyacheslav Nikolaevich, 4,009,044.

Polysius AG: *See*—
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.

Pommier, Claude; and Albertin, Andre, to Thomson-CSF. Cathode-ray tubes electron-guns. 4,009,410, Cl. 313-411.000.

Pont-A-Mousson S.A.: *See*—
Bellocci, Rio; and Degois, Michel, 4,008,749.
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,008,751.

Popel, Viktor Mikhailovich: *See*—
Sverchkov, Jury Sergeevich; Balashova, Nadezhda Nikolaevna; Popel, Viktor Mikhailovich; and Shmatok, Viktor Petrovich, 4,008,673.

Poradowski, Lech M., to Roanwell Corporation. Reversible anti-noise microphone. 4,009,355, Cl. 179-121.00D.

Poschmann, Franz; and Bergold, Wolfram, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Aqueous antifoaming emulsions. 4,009,119, Cl. 252-358.000.

Post Office, The: *See—*
Thompson, John Edward, 4,009,486.

Potter, Jesse L.: *See—*
Behrendt, George H.; and Potter, Jesse L., 4,009,104.

Pozzo, James A.; and Yan, Maxwell M., to Abitibi Paper Company Ltd. Production of hardboard in a closed water system. 4,009,073, Cl. 162-132.000.

PPG Industries, Inc.: *See—*
Erikson, J. Alden; and Niederst, Ken W., 4,009,307.
Jones, James E., 4,009,133.

Preis, Lothar, to Bayer Aktiengesellschaft. Reinforced plastics and a process for their production. 4,009,043, Cl. 106-204.000.

Presto Lock Company, Division of Walter Kidde & Comany, Inc.: *See—*
Wingert, Rudolf, 4,008,584.

Price, Raymond C. Foldable sample display table. 4,008,670, Cl. 108-28.000.

Prodel, Marcel, to Societe anonyme dite: Mecanoser S.A. Band clamp of plastics material. 4,008,512, Cl. 24-16.0PB.

Products for Proud Parents Limited: *See—*
Cooper, Howard Lee; and Banks, Stewart, 4,008,918.

Proops, William Robert: *See—*
Papa, Anthony Joseph; and Proops, William Robert, 4,009,129.

Properzi, Giulio. Continuous casting machine of the wheel and band type. 4,008,753, Cl. 164-278.000.

Przybylski, Frank J., to Honeywell Inc. Manual override using a variable clock frequency in a control system employing a D/A converter to translate digital control signals from a digital computer to analog signals for operating process control devices. 4,009,372, Cl. 235-92.0CC.

Puhak, Peter George, to GTE Sylvania Incorporated. Alignment means for electron gun structures. 4,009,411, Cl. 313-456.000.

Pulda, William F., to Vanguard Machinery Corporation. Method and apparatus for transporting materials. 4,008,890, Cl. 271-151.000.

Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, to Asko, Inc. Work reducing. 4,008,598, Cl. 72-237.000.

Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, to Asko, Inc. Force applying. 4,008,970, Cl. 403-31.000.

Putz, A. Frank. Rotary piston expansible chamber device. 4,008,988, Cl. 418-54.000.

Queen Casuals, Inc.: *See—*
Cianciotti, Nicholas, 4,008,672.

Rabinovich, Volf Iudovich; Kriger, Jury Nikolaevich; Karpov, Oleg Stepanovich; Sapunov, Viktor Evgenievich; Karpov, Vladimir Alexeevich; and Kovenya, Vladimir Yakovlevich. Plant for the electroslag melting of shaped castings. 4,008,752, Cl. 164-252.000.

Rackoff, Selwyn Raymond: *See—*
Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,598.
Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,970.

Raffinerie Tirlemontoise: *See—*
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Rahman, Salah-Eldin: *See—*
Kaupmann, Wilhelm; von Eickstedt, Klaus-Wolf; and Rahman, Salah-Eldin, 4,009,184.

Rahman, Syed A. Method and apparatus for protecting a double-shelled chimney stack. 4,008,655, Cl. 98-46.000.

Rakshys, Joseph W., Jr.: *See—*
Rupprecht, Walter E. F.; Lane, Eckel R.; and Rakshys, Joseph W., Jr., 4,008,544.

Ramakrishnan, Kottieth: *See—*
Warkentin, John; Ramakrishnan, Kottieth; Jain, Rup C.; and Wandelmaier, Frank W., 4,009,276.

Ramond, Louis Maurice. Fork for steering wheel of various cycles. 4,008,903, Cl. 280-279.000.

Ramsay, Jack D., to Raymond Lee Organization, Inc., The, a part interest. Razor safety rack. 4,008,808, Cl. 211-65.000.

Rasile, John: *See—*
Bakos, Peter; and Rasile, John, 4,009,033.

Rasmussen, Robert T. C., to Kawecki Berylco Industries, Inc. Strontium-silicon-aluminum master alloy and process therefor. 4,009,026, Cl. 75-148.000.

Rast, Robert Morgan, to RCA Corporation. Programming unit for a television tuning phase locked loop. 4,009,439, Cl. 325-421.000.

Rauma-Repola Oy: *See—*
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Rauscher, Herbert E.: *See—*
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Raychem Corporation: *See—*
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Raymond Lee Organization, Inc., The: *See—*
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Gager, Dennis J., 4,008,530.
Holland, Ada R., 4,009,384.
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RCA Corporation: *See—*
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Rea, Everett Dale; and Rea, Terry Gene. Rotary engine. 4,008,693, Cl. 123-8.250.

Rea, Terry Gene: *See—*
Rea, Everett Dale; and Rea, Terry Gene, 4,008,693.

Recchuite, Alexander D.: *See—*
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Redco, Inc.: *See—*
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Redmond, John Peter; Andrews, Daniel Marshall; and Guyler, Karl Edward, to AMP Incorporated. Gold deposition procedures and substrates upon which gold has been deposited. 4,009,297, Cl. 427-54.000.

Reeve, Gerome R.: *See—*
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Reichelt, Achim: *See—*
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Reid, James P., Jr.; and McConnell, Bobby L., to Burlington Industries, Inc. Process for the production of space-dyed effects on acrylic yarns. 4,009,001, Cl. 8-15.000.

Reilly, James E.; Klaene, Frank A.; and Dunn, Michael E., to F. N. Shepard & Company. Guide for conveyor belt. 4,008,801, Cl. 198-841.000.

Reimann, Hans: *See—*
Ilavsky, Jan; Bayan, Aris P.; Charney, William; and Reimann, Hans, 4,009,269.

Rein, Charles R. Power plant with air working fluid. 4,008,574, Cl. 60-682.000.

Reindl, Klaus, to Siemens Aktiengesellschaft. Metal semiconductor diode. 4,009,481, Cl. 357-15.000.

Reiner, Lawrence L.; and McNett, John P., to Reiner, Lawrence L. Maze game. 4,008,895, Cl. 273-113.000.

Renner, David L. Railroad tecter switch game. 4,008,894, Cl. 273-110.000.

Renold, Adolph, to Colgate-Palmolive Company. Topical compositions. 4,009,254, Cl. 424-59.000.

Renoux, Charles Simon. Container closure having tear-away construction. 4,008,824, Cl. 220-270.000.

Renwick of Canada Inc.: *See—*
Schnitzer, Edmund, 4,008,586.

Rethorst, Scott Carson, to Vehicle Research Corporation. Compression energy transformation system for a supersonic wing. 4,008,866, Cl. 244-1.00N.

Rex, Roger F., to Display Corporation International. Showroom window display hanger. 4,008,871, Cl. 248-205.00A.

Rexnord Inc.: *See—*
Forsyth, Emil John, 4,008,800.
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Reynolds, Edward B., to Continental Oil Company. Method of predicting geothermal gradients in wells. 4,008,608, Cl. 73-154.000.

Reytblatt, Zinovy V. Photoelastic strain gauge coating and method of using same. 4,008,960, Cl. 356-33.000.

Rhoads, Roger R.: *See—*
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Rhodes, Cecil J.: *See—*
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Rhodia, Inc.: *See—*
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Ricoh Co., Ltd.: *See—*
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Rigalt, Gonzalo. Brake lining wear detector. 4,009,465, Cl. 340-52.00A.

Rim, Yong S.: *See—*
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Ringel, Samuel M.: *See—*
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Ripperger, Willi: *See—*
Geierhaas, Herbert; Ripperger, Willi; and Herrmann, Walter, 4,009,125.

Ritchie, James A., to Caterpillar Tractor Co. Combined timing gear and pump for rotary mechanisms. 4,008,987, Cl. 418-53.000.

Rittler, Hermann L., to Corning Glass Works. Transparent, infra-red transmitting glass-ceramics. 4,009,042, Cl. 106-39.700.

Rizzuto, L. P., to Conair Corporation. Steam-producing curling iron. 4,009,367, Cl. 219-222.000.

Roach, Maurice P.; Schoenjahn, Ann E.; and Carmack, Larry G., to Deere & Company. Determination of carbon analysis in irons. 4,008,604, Cl. 73-17.00R.

Roanwell Corporation: *See—*
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Poradowski, Lech M., 4,009,355.

Roberts, Michael G.: *See—*
Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., 4,009,317.

Robertson, James H. Freestanding-fireplace and stove heat shield. 4,008,705, Cl. 126-121.000.
Roche, Thomas F. Universal electrical swivel. 4,008,910, Cl. 285-164.000.
Rockwell International Corporation: *See—*
Schrader, Carl N.; and Fisher, Frank H., 4,008,517.
Taylor, H. Scott, 4,009,374.
Rodth, Joseph John, to Coca-Cola Co., The. Three drink gravity dispenser for cool beverages. 4,008,832, Cl. 222-129.100.
Roedel, Charles W.: *See—*
Borysiewicz, Richard; and Roedel, Charles W., 4,009,356.
Roffia, Paolo: *See—*
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Rogers, Charles W. Process of fabricating composite structural members. 4,009,067, Cl. 156-245.000.
Rohm and Haas Company: *See—*
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De Benneville, Peter L.; Moss, Jack N.; and Dajani, Esam Z., 4,009,284.
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Roos, Robert; and Kuhn, Peter J., to Naarden International, N.V. Method for preventing the formation of turbidity and/or deposits in non-alcoholic beverages containing sucrose and concentrates for such beverages. 4,009,289, Cl. 426-330.300.
Rose, Gerald D.: *See—*
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Ross, Gary T., to United States of America, Army. Capacitor discharge of latching relays and rotary filter. 4,009,011, Cl. 55-273.000.
Ross, Karl J., to American Gage & Manufacturing Co. Portable winch ratchet dog. 4,008,881, Cl. 254-164.000.
Rothkegel, Bernhard; and Schreiner, Horst, to Siemens Aktiengesellschaft. Contact member and method of manufacture. 4,008,520, Cl. 29-630.00C.
Rotostat I/S: *See—*
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Ruck, Werner: *See—*
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Sauer, Philip D.; and Payne, Thomas F., to Anaconda Company, The. Method and apparatus for foam scrubber level detector. 4,009,010, Cl. 55-87.000.
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Schemmann, Hugo; and Bertram, Leo, to U.S. Philips Corporation. Pumping device for fluids. 4,008,985, Cl. 417-423.00R.

Schenk, Gerd; and Haake, Heinz, to Varta Batterie Aktiengesellschaft. Wrapped-electrode battery. 4,009,053, Cl. 429-94.000.

Scherer, Jeremy D., to Isotronics, Inc. Ultraviolet-transmitting window for a PROM. 4,008,945, Cl. 350-1.000.

Schering Aktiengesellschaft: *See—*
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Schleppnik, Alfred A.; and Vanata, Steve G., to Monsanto Company. 4-Cyclohexyl-4-methyl-2-pentanone useful as a malodor counteractant. 4,009,253, Cl. 424-45.000.

Schmerling, Louis, to Universal Oil Products Company. Conversion of olefins to esters. 4,009,203, Cl. 260-497.00R.

Schmidt, Erwin: *See—*
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Schmidt, Rudolf: *See—*
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Schnetzer, Max; and Merimaki, Risto, to Heberlein Maschinenfabrik AG. Threading device for a false-twist texturing machine without upper structure. 4,008,560, Cl. 57-34.0HS.

Schnitzer, Edmund, to Renwick of Canada Inc. Key attachment device for key case. 4,008,586, Cl. 70-456.00B.

Schoenberg, Jules E., to National Starch and Chemical Corporation. Starch-based alkaline curing corrugating adhesives containing, as crosslinking agent, the reaction product of a ketone, formaldehyde and a secondary amine. 4,009,311, Cl. 428-182.000.

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Scholle, William R. Pump apparatus. 4,008,984, Cl. 417-393.000.

Schonbrun, Tibor; and Tremblay, Victorien, to Genesport Industries Limited. Protective footwear. 4,008,531, Cl. 36-106.000.

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Schrawer, Rolf; Bardenheier, Josef; and Koch, Jurgen, to Messer Griesheim GmbH. Process for the production of slush of low-boiling gases. 4,009,013, Cl. 62-10.000.

Schreiber, Sally Ann; and Williams, Thomas Walley, III. Illuminated fiber optic jewelry. 4,009,381, Cl. 240-1.0EL.

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Schultz, Gary Lee; and Whisler, Edwin Lee, to Deere & Company. Linkages for moving and retaining a control lever to and in a non-use position. 4,008,626, Cl. 74-491.000.

Schultz, Gerhart: *See—*
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Schultz, Thomas E.; and Schuchardt, Peter W., to Minnesota Mining and Manufacturing Company. Strip applying device. 4,009,072, Cl. 156-584.000.

Schulz, Johann G. D.: *See—*
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Schwan, Thomas J.; Davis, Charles S.; and Honkomp, LeRoy J., to Morton-Norwich Products, Inc. Compound 2-(2-thiazolyl)-5,6-dimethoxyindazoles. 4,009,177, Cl. 260-306.80R.

Scobbo, James Joseph, to General Tire & Rubber Company, The. Method of improving adhesion of secondary backings on carpets. 4,009,310, Cl. 428-95.000.

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Seachman, Ned J., to Xerox Corporation. Arrangement for extending photosensor array resolution. 4,009,388, Cl. 250-208.000.

Sears, Edward A. Reclaiming system for foundry sand. 4,008,856, Cl. 241-46.00R.

Seer, Harold George, Jr., to RCA Corporation. Negative color film mask correction. 4,009,489, Cl. 358-80.000.

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Sell, Darrell Dean, to Bell Telephone Laboratories, Incorporated. Laser control circuit. 4,009,385, Cl. 250-199.000.

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Severin, Norman W., to Hotwork, Inc. Method of preheating the wall of a furnace channel and article for generating circulation of heated air for preheating the wall of a furnace channel. 4,008,993, Cl. 432-4.000.
Shafer, LaVerne. Energized cobalt-containing animal feed. 4,009,263, Cl. 424-131.000.
Shafii-Kahany, Hooshang; and McCart, Larry D., to Cascade Corporation. Takeup reel for combined hose and cable. 4,008,791. Cl. 191-12.20R.
Sharon Manufacturing Company: *See—*
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Shimada, Osamu: *See—*
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Shimono, Nobuo; and Marubayashi, Hideki, to Babcock & Wilcox Company, The. Pressure relief system. 4,008,734, Cl. 137-314.000.
Shin, Hyunkook, to Du Pont de Nemours, E. I., and Company. Vapor-phase preparation of aromatic polyamides. 4,009,153, Cl. 260-78.00R.
Shinagawa Refractories Co., Ltd.: *See—*
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Sigwarth, Herbert Francis; and Cade, Richard Lukens, to Deere & Company. Seat safety bar. 4,008,917, Cl. 296-65.00A.
Silva, Jose R.; and Narrace, John M. Brain wave correlation system and method of delivering a recorded program of material educational in content. 4,008,714, Cl. 128-2.10B.
Simon, Paul W., to Burroughs Corporation. Etchant and method of etching tin oxide film. 4,009,061, Cl. 156-635.000.
Singer Company, The: *See—*
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Smellie, Allan M.; and Brandstatter, Hans G., to Ontario Research Foundation. Production of metal carbides. 4,009,247, Cl. 423-440.000.
Smith, Calvin Schwartz, Jr. Production of energy by direct contact of water immiscible working fluid with hot or warm water to vaporize liquid working fluid, utilization of vapor to produce mechanical energy and direct contact of spent vapor with cold or cool water to condense same. 4,009,082, Cl. 203-11.000.
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Smith, David Ernest: *See—*
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Smith, Donald Lee, to AMP Incorporated. Printed circuit board housing system. 4,008,941, Cl. 339-91.00P.
Smith, F. Charles. Package for two reactive ingredients of a desired mix in a single pack. 4,008,803, Cl. 206-220.000.
Smith, George W., to Envirex Inc. Clarifier with overflow scum removal. 4,009,106, Cl. 210-195.00S.
Smith, Joseph. Axle mountings. 4,008,507, Cl. 16-34.000.
Smith, Kendall S., II: *See—*
Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,008,931.
Smith, Ronald S. Video display system and method employing propagating stress waves. 4,009,488, Cl. 358-62.000.
Smith, Stuart D. Portable docks and bridges. 4,008,506, Cl. 14-71.100.
Smith, William Mayo, Jr.: *See—*
Dixon, Dale D.; and Smith, William Mayo, Jr., 4,009,304.
Smorenburg, Johannes Jacobus, to Stark Amsterdam NV. Device for vacuum treatment of liquids by means of a gaseous strip-medium. 4,009,230, Cl. 261-148.000.
Snam Progetti S.p.A.: *See—*
Paret, Giancarlo; and Cinelli, Ermanno, 4,009,084.
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., to Norfin, Inc. Sheet binding apparatus. 4,009,071, Cl. 156-563.000.
Societe anonyme dite Etablissement GENOUD & Cie.: *See—*
Johnsson, Lars Bertil, 4,008,992.
Societe Anonyme dite: L'Oreal: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,008,999.
Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,009,255.
Societe anonyme dite: Mecanoser S.A.: *See—*
Prodel, Marcel, 4,008,512.
Societe d'Etudes de Machines Thermiques: *See—*
Bouquet, Jean-Claude, 4,008,695.
Bouquet, Jean-Claude, 4,008,981.
Societe Generale pour l'Emballage: *See—*
Boussageon, Pierre, 4,009,068.
Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
Pierlot, Michel, 4,008,700.
Societe Jeantil & Cie: *See—*
Carree, Francis, 4,008,826.
Solfan Security Systems: *See—*
Lutz, Erno B., 4,009,476.
Sony Corporation: *See—*
Kihara, Nobutoshi; and Shimada, Osamu, 4,009,492.
Sasaki, Masanobu, 4,009,401.
Soteropulos, Gust; and Vogt, James Lee, to Deere & Company. Hitch adapter. 4,008,905, Cl. 280-506.000.
Sparcatron Limited: *See—*
Stanton, Anthony Howard; and Taylor, Peter Laurence, 4,009,361.
Spears, Esten W., Jr.; and Young, Eugene R., to General Motors Corporation. Combustor support. 4,008,568, Cl. 60-39.320.
Spector, George: *See—*
Milano, Martin B.; Rutherford, David A.; and Spector, George, 4,008,774.
SpectraMetrics, Incorporated: *See—*
Elliott, William G.; and Karlinski, Thomas J., 4,009,413.
Spellman, Patrick Joseph: *See—*
Megahed, El Sayed; Buelow, Carol Ruth; and Spellman, Patrick Joseph, 4,009,056.
Sperry Rand Corporation: *See—*
Danilenko, Michael; Davis, James Robert, Jr.; and Boehm, Arthur Flets, 4,009,470.
Grimes, Terrence L.; and Neis, Thomas W., 4,009,464.
Miller, Floyd V., 4,009,402.
Spietschka, Ernst: *See—*
Deucker, Walter; Spietschka, Ernst; and Steidl, Dieter, 4,009,180.
Splitt, Frank G.; and Scheithauer, Eric A., to Cook Electric Company. Station protector with a three-electrode gas tube arrester. 4,009,421, Cl. 361-119.000.
Spooner, James E. Method for producing champagne. 4,009,285, Cl. 426-8.000.
Staat der Nederlanden, Posterijen, Telegrafie en Telefonie: *See—*
Leersnijder, Carolus Pieter, 4,008,813.
Stad, Andrew N., to Baldwin-Gegenheimer Corporation. Protective system for evacuating drums. 4,008,516, Cl. 29-428.000.
Stahlecker, Fritz: *See—*
Karolyi, Oskar, 4,008,887.
Stahlecker, Hans: *See—*
Karolyi, Oskar, 4,008,887.
Stahlhut, Leo G.; and Trantina, Walter J., to Emerson Electric Co. Adjustable air blade for air handling luminaires. 4,008,654, Cl. 98-40.0DL.
Stahlmann, Rudolf: *See—*
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Staley, Lester K.: *See*—
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Stamicarbon B.V.: *See*—
Wildschut, Jan H., 4,008,932.
Standard Pressed Steel Co.: *See*—
Boys, John T., 4,008,772.
Wallace, Paul W.; and Boys, John T., 4,008,773.
Stanley Aviation Corporation: *See*—
Filippi, Ernest A., 4,008,937.
Stanley, Robert K.: *See*—
List, Ralph W.; and Stanley, Robert K., 4,008,859.
Stanton, Anthony Howard; and Taylor, Peter Laurence, to Sparcatron Limited. Electrical discharge machining apparatus with monitoring circuit and means to check the operability of the monitoring circuit. 4,009,361, Cl. 219-69.00C.
Stark Amsterdam NV: *See*—
Smorenburg, Johannes Jacobus, 4,009,230.
Starke, George Robert; and Cooke, Anson Richard, to Amchem Products, Inc. Method of regulating plant growth. 4,009,020, Cl. 71-76.000.
Stauffer Chemical Company: *See*—
Baker, Don R., 4,009,190.
Baker, Don R., 4,009,191.
Stautzenberger, Adin Lee; and Paul, James Leonard, to Celanese Corporation. Method for determining suitability of triorganophosphorus ligands for use in hydroformylation processes. 4,009,003, Cl. 23-230.00R.
Steckler, Robert; and Linder, Seymour Martin, to Alcolac Inc. Polymerizable cationic monomers. 4,009,201, Cl. 260-486.00R.
Steidl, Dieter: *See*—
Deucker, Walter; Spictschka, Ernst; and Steidl, Dieter, 4,009,180.
Stein, Werner; and Hartmann, Helmut, to Henkel & Cie G.m.b.H. Continuous process for the separation of mixtures of fatty substances of different melting points. 4,009,213, Cl. 260-643.00D.
Stemmle, Denis L., to Xerox Corporation. Document handling system for pre-collation copying. 4,008,956, Cl. 355-8.000.
Sterling Drug Inc.: *See*—
Albertson, Noel F., 4,009,171.
Cutler, Royal A.; and Schalit, Samuel, 4,009,163.
Diana, Guy D., 4,009,170.
Lesher, George Y., 4,009,208.
Sterner, Melvin F.: *See*—
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Stewart-Warner Corporation: *See*—
Payne, Robert A.; Slobodzian, Gregory E.; Zielinski, Stanley A.; and Ravanesi, Ralph M., 4,009,335.
Stickel, Richard: *See*—
Hess, Klaus; Stickel, Richard; Nagel, Otto; Sinn, Richard; and Daucher, Hans, 4,009,100.
Stilz, Walter: *See*—
Scheuermann, Horst; and Stilz, Walter, 4,009,193.
Stock, Arthur J.; and Christofer, Donald E., to Stock Equipment Company. Apparatus for receiving and compacting waste material. 4,008,658, Cl. 100-53.000.
Stock Equipment Company: *See*—
Stock, Arthur J.; and Christofer, Donald E., 4,008,658.
Stone, Kirby Lee: *See*—
Chandra, Rangasami Sarat; and Stone, Kirby Lee, 4,008,829.
Stoner, Glenn E.: *See*—
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Stork Brabant B.V.: *See*—
Vertegaal, Jacobus Gerardus, 4,008,684.
Stotts, Larry B.: *See*—
Bocker, Richard P.; Bromley, Keith; Monahan, Michael A.; and Stotts, Larry B., 4,009,380.
Stuart, Meredith, to Forster Mfg. Co., Inc. Stick storage apparatus with automatic reject system for misaligned sticks. 4,008,812, Cl. 214-6.0BA.
Sublistatic Holding S.A.: *See*—
Serex, Charles; Hugelin, Bernard; and Decombe, Robert, 4,008,998.
Sugimoto, Yoshihiko: *See*—
Komatsu, Noboru; Arai, Tohru; and Sugimoto, Yoshihiko, 4,009,086.
Sugou, Susumu: *See*—
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Sumitomo Bakelite Company, Limited: *See*—
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Sumitomo Chemical Company, Limited: *See*—
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Summers, James E., to Xerox Corporation. Reproduction machine control. 4,008,957, Cl. 355-14.000.
Sumrell, Robert Earl. Resiliently biased tie-down anchor. 4,008,669, Cl. 105-484.000.
Sun Oil Company of Pennsylvania: *See*—
Newingham, Thomas D.; and Recchuite, Alexander D., 4,009,117.
White, Chester N.; and Lindsay, John F., 4,008,865.
Sun Shipbuilding and Dry Dock Co.: *See*—
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Suntech, Inc.: *See*—
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Suzuka, Osamu: *See*—
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Suzuki, Taichi: *See*—
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Sverchkov, Jury Sergeevich; Balashova, Nadezhda Nikolaevna; Popel, Viktor Mikhailovich; and Shmatok, Viktor Petrovich. Buoyancy control system for submersible vessels. 4,008,673, Cl. 114-16.00E.
Swainson, Ralph V., to Texas Bryre Industries. Humidor. 4,008,930, Cl. 312-31.100.
Swartz, Gordon P. Rotating display with black light illumination. 4,008,534, Cl. 40-106.520.
Swett, James B.; and Ashton, Harold P., to Dart Industries Inc. Openable curvilinear openings of different geometrical shapes. 4,008,526, Cl. 35-22.00A.
Syntex Corporation: *See*—
Fried, John H.; and Harrison, Ian T., 4,009,197.
Syntex (U.S.A.) Inc.: *See*—
Beard, Colin C., 4,009,164.
Sypula, Richard Joseph, to Eastman Kodak Company. Video noise reduction circuit. 4,009,334, Cl. 358-167.000.
Szatkowski, Richard R.: *See*—
Erlandson, Paul M.; and Szatkowski, Richard R., 4,009,234.
Sze, Morgan C.; and Paustian, John E., to Lummus Company, The. Separation of hydrogen fluoride from hydrogen chloride gas. 4,009,214, Cl. 260-653.700.
Szucs, Laszlo; Tasnadi, Csaba; and Lindner, Istvan, to Patentburcau Danubia. Apparatus for heat- and mass transfer between liquids and gases. 4,009,229, Cl. 261-72.00R.
Tacker, John J.: *See*—
Biddle, William P.; and Tacker, John J., 4,009,302.
Tadashi, Zenbutsu; Hajime, Asami; Seiichi, Uemura; and Takao, Hirose, to Shinagawa Refractories Co., Ltd.; and Nippon Oil Company Ltd. Process for producing refractories. 4,009,308, Cl. 427-443.000.
Tadokoro, Yozo: *See*—
Okumori, Toshio; Tadokoro, Yozo; Takagi, Yoshiyuki; and Yoshida, Nobuo, 4,009,290.
Tajara Shoyei Kiko K.K.: *See*—
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Takabe, Reiho: *See*—
Fujimaki, Hiroto; Kodama, Fumio; Takabe, Reiho; Asano, Kiro; and Seguchi, Koji, 4,009,305.
Takada, Akira; and Sakai, Tadao, to Roland Corporation. Device for modulating a musical tone signal to produce a rotating sound effect. 4,008,641, Cl. 84-1.240.
Takagi, Yoshiyuki: *See*—
Okumori, Toshio; Tadokoro, Yozo; Takagi, Yoshiyuki; and Yoshida, Nobuo, 4,009,290.
Takahashi, Shuichi. Adaptive control system for an alternating-current motor. 4,009,427, Cl. 318-227.000.
Takao, Hirose: *See*—
Tadashi, Zenbutsu; Hajime, Asami; Seiichi, Uemura; and Takao, Hirose, 4,009,308.
Takeda Chemical Industries, Ltd.: *See*—
Numasaki, Kouichi; Ninomiya, Nobutaka; Matsumoto, Zenji; Adachi, Kiyoshi; and Fujimoto, Toyohisa, 4,008,994.
Takeda, Kiyoshi: *See*—
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Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Iinuma, Hironobu; and Tanabe, Osamu, 4,009,155.
Talkington, Howard R., to United States of America, Navy. Ship's bottom inspection apparatus. 4,008,606, Cl. 73-104.000.
Tallmadge, Gene E.; and Gerling, John E., to Chemetron Corporation. Method and apparatus for controlling microwave ovens. 4,009,359, Cl. 219-10.55B.
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,009,111, Cl. 252-62.550.
Tamers, Murry A. Total synthesis of benzene from non-hydrocarbon materials. 4,009,219, Cl. 260-673.000.
Tamm, Rolf Gunther Arnold: *See*—
Huber, Bernhard Werner; and Tamm, Rolf Gunther Arnold, 4,008,963.
Tamura, Masaoki: *See*—
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Tanabe, Osamu; Obayashi, Akira; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Matsumura, Shingo, to Nippon Shinyaku Co., Ltd. Process for the preparation of phenopicolinic acid. 4,009,077, Cl. 195-81.000.
Tanabe, Osamu: *See*—
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Tanaka, Atsuo; Tokura, Koichi; and Kawahara, Hiroki, to Fujitsu Ltd. Information transfer system. 4,009,471, Cl. 340-172.500.
Tanaka, Junkichi, to Tanaka Paper Tube Co. Ltd. Paper bobbins. 4,008,860, Cl. 242-46.210.
Tanaka, Katsutoshi: *See*—
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.
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Tanaka, Susumu: *See*—
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Tanaka, Toshio: *See*—
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Tanguy, Pierre: *See*—
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Tarro, Richard E. Container with attached pull tab opener. 4,008,823, Cl. 220-269.000.
Tasaka, Shigeo: *See*—
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Tasnadi, Csaba: *See*—
Szucs, Laszlo; Tasnadi, Csaba; and Lindner, Istvan, 4,009,229.
Tate, Michael Bernard, to Marconi Company Limited, The. Fault bypass for a processor associated scanner. 4,009,348, Cl. 179-15.0BF.
Tatham, Walter A., to Lear Siegler, Inc. Diffuser. 4,008,653, Cl. 98-40.00D.
Taylor, Barry Edward, to Du Pont de Nemours, E. I., and Company. Substituted lithium phosphates and solid electrolytes therefrom. 4,009,092, Cl. 204-242.000.
Taylor, H. Scott, to Rockwell International Corporation. Pseudo-random bidirectional counter. 4,009,374, Cl. 235-92.0SH.
Taylor, Peter Laurence: *See*—
Stanton, Anthony Howard; and Taylor, Peter Laurence, 4,009,361.
Tazuma, James J.; and Muse, Joel, to Goodyear Tire & Rubber Company, The. Primary amine-modified anhydride resin. 4,009,228, Cl. 260-878.00R.
Tech Development Inc.: *See*—
Flatt, Joseph; LoPiccolo, Robert C.; and Linsker, Eugene, 4,008,983.
Tec-Pak, Inc.: *See*—
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Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., to Cosden Technology, Inc. Clear ethylene polymer emulsions having light transmission of at least 95% and polishes containing the same. 4,009,140, Cl. 260-29.6XA.
Teijin Limited: *See*—
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, 4,009,196.
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Terracina, Vittorino. Typewriting machine. 4,008,793, Cl. 197-1.00A.
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Texaco Development Corporation: *See*—
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Cole, Edward L.; and Nolan, John T., Jr., 4,009,094.
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Texas Instruments Incorporated: *See*—
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Textron, Inc.: *See*—
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Hague, Robert Z.; Loos, George J.; and Marsicano, Matthew F., 4,008,518.
Hague, Robert Z.; Loos, George J.; and Marsicano, Matthew F., 4,008,646.
Hague, Robert Z.; Loos, George J.; and Marsicano, Matthew F., 4,008,647.
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Th. Kieserling & Albrecht: *See*—
Lorenz, Horst; and Pauls, Kurt, 4,008,840.
Tharp, Marvin E. Rotary shower brush. 4,008,503, Cl. 15-21.00D.
Theeuwes, Felix; and Ayer, Atul D., to Alza Corporation. Osmotic system having laminar arrangement for programming delivery of active agent. 4,008,719, Cl. 128-260.000.
Thielbahr, William H.: *See*—
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Thinschmidt, Hans: *See*—
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Thomas, Derek; and Zola, Heddy, to Burroughs Wellcome, Inc. Preparation of immunosuppressive materials. 4,009,257, Cl. 424-85.000.
Thomas, Stephen R. Tub pad. 4,008,498, Cl. 4-180.000.
Thompson, George W.; and Hilgenbrink, John T., to Continental Can Company, Inc. Necked-in can body and apparatus for making same. 4,008,821, Cl. 220-67.000.
Thompson, John Edward, to Post Office, The. Digital encoding system. 4,009,486, Cl. 358-13.000.
Thompson, Richard W. Module supporting system. 4,008,872, Cl. 248-224.200.
Thompson, Vernon R.: *See*—
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Thompson, William S., to Elkhart Brass Manufacturing Co., Inc. Pressure reducing fire valve. 4,008,735, Cl. 137-495.000.
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Thornton, Thomas F. Interproximal space tooth cleaner. 4,008,727, Cl. 132-89.000.
Tickel, H. Edward, Jr.: *See*—
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Tickel, Herman Edward, Jr.: *See*—
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Tolar, Jimmie G.: *See*—
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Tomio, Uchida, to Caterpillar Mitsubishi Ltd. Two-way bulldozer mechanism. 4,008,771, Cl. 172-806.000.
Topfl, Rosemarie; and Von Rutte, Richard, to Ciba-Geigy Corporation. Copolymers of maleic anhydride, diketene and alkyl ethers, process for their manufacture and their use. 4,009,110, Cl. 252-8.900.
Torii, Mitsuru: *See*—
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Torphammar, Nils Gustav Yngve; and Torphammar, Per Gustav. Locking mechanism for a safety belt. 4,008,864, Cl. 242-107.40R.
Torphammar, Per Gustav: *See*—
Torphammar, Nils Gustav Yngve; and Torphammar, Per Gustav, 4,008,864.
Toru, Takeshi: *See*—
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Towmotor Corporation: *See*—
Evans, Dafydd Williams, 4,008,571.
Towns, Edward J. Tip seal for a dispensing valve. 4,008,834, Cl. 222-402.230.
Toyo Boseki Kabushiki Kaisha: *See*—
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Hayashi, Ikuya; Uno, Keiichi; and Matsuoka, Mikio, 4,009,312.
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Trantina, Walter J.: *See*—
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Traut, Earl W. Rotary fluid energy converter. 4,008,982, Cl. 417-204.000.
Travaglio, Vincent M.; and Magnifico, Michael L., to Emhart Industries, Inc. Angularly adjustable shelf bracket. 4,008,873, Cl. 248-242.000.
Treff, Ernest H.: *See*—
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Tregillus, Kenneth C., to Vernay Laboratories, Inc. Pressure responsive self-purging emitter. 4,008,853, Cl. 239-542.000.
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Triumph Werke Nurnberg A.G.: *See*—
Decker, Herbert, 4,008,794.
Trolle, Sten, to AB Carbox. Frame for presses and similar machines. 4,008,659, Cl. 100-214.000.
Tsuda, Hiroshi; and Hayasaka, Toshimi, to Olympus Optical Co., Ltd. Pointer projecting means for microscopes. 4,008,946, Cl. 350-10.000.
Tsujino, Kazuaki; Kida, Junnosuke; Hosotani, Masanobu; Minamiura, Noshi; and Yamamoto, Takehiko, to Ono Pharmaceutical Co., Ltd. Method for quantitatively determining glucoamylase in human urine and body fluids. 4,009,079, Cl. 195-103.50R.
Tullier, Leo D.; and Vignone, John F. Fluid filter flow arrangement. 4,009,109, Cl. 210-447.000.
Turkenkopf, Eugene: *See*—
Alter, Seymour B.; and Turkenkopf, Eugene, 4,008,650.
Turner, Robert Bruce; and Brefka, Paul E., to Johnson & Johnson. Removable probe unit for electronic measuring system. 4,008,614, Cl. 73-343.00R.
Turocy, Elmer W., to S. P. Kinney Engineers, Inc. Fluid flow measuring apparatus. 4,008,611, Cl. 73-205.00R.
U. C. B., Societe Anonyme: *See*—
Lietard, Jean-Marie; and Matthijs, Guido, 4,009,186.
UBE Industries, Ltd.: *See*—
Masaki, Mitsuo; Matsunami, Satoshi; Kita, Jyunichiro; and Hayashi, Toshikazu, 4,009,168.
Umemura, Sumio; Ohdan, Kyoji; Matsuzaki, Tokuo; Nakamura, Yasuo; and Sawazi, Masao, 4,009,194.
Uchidoi, Masanori: *See*—
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; and Uchidoi, Masanori, 4,009,480.
Uddeholms Aktiebolag: *See*—
Oberg, Karl Erik; and Sjoberg, Bengt Olof, 4,009,023.
Ueda, Takeshi; Koizumi, Kunihei; Otani, Tatsu; and Hironaka, Shunichi, to Nippon Kokan Kabushiki Kaisha. Dust arresting apparatus for a coke dry quenching station. 4,009,081, Cl. 202-227.000.
Uhrig, Heinz: *See*—
Deubel, Reinhold; Grossmann, Max; Hemmerling, Volker; and Uhrig, Heinz, 4,009,142.
Uitti, Kenneth D., to Universal Oil Products Company. Process for production and dehydrogenation of ethylbenzene. 4,009,217, Cl. 260-669.00R.
Uitti, Kenneth D., to Universal Oil Products Company. Alkylaromatic hydrocarbon dehydrogenation process. 4,009,218, Cl. 260-669.00R.
Ullrich, Roswitha: *See*—
Becker, Manfred; and Ullrich, Roswitha, 4,009,036.
Umemura, Sumio; Ohdan, Kyoji; Matsuzaki, Tokuo; Nakamura, Yasuo; and Sawazi, Masao, to UBE Industries, Ltd. Catalytic ammoxidation of olefins to nitriles. 4,009,194, Cl. 260-465.300.
Umezawa, Hamao; Takeuchi, Tomio; Iinuma, Hironobu; and Tanabe, Osamu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. P-carboxyphenyl-azoxycarbonitrile and its methyl ester. 4,009,155, Cl. 260-141.000.
Union Carbide Corporation: *See*—
Arney, William Charles; Williams, Clarence Alfred; and Glass, Joseph Edward, Jr., 4,009,329.
Love, Gordon R., 4,008,602.
Papa, Anthony Joseph; and Proops, William Robert, 4,009,129.
Uniroyal, Inc.: *See*—
Little, Julian R.; Nudenberg, Walter; and Rim, Yong S., 4,009,200.
United Merchants and Manufacturers, Inc.: *See*—
Carter, William, 4,009,002.
United States Gypsum Company: *See*—
Long, William J., 4,009,062.
U.S. Industries, Inc.: *See*—
van Huis, Robert L., 4,008,690.
United States of America
Agriculture: *See*—
Freedman, Bernard; and Diamond, Martin J., 4,009,324.
Freedman, Bernard; and Diamond, Martin J., 4,009,325.
America: *See*—
Griffith, James M.; and Henry, Walter L., 4,008,713.
Army: *See*—
Elbe, Ronald E., 4,008,537.
Frank, Konrad; and Klon, Peter F., 4,008,966.
Ross, Gary T., 4,009,011.
Woods, Robert L., 4,008,601.
Commerce: *See*—
Larsen, Neil T.; and Reeve, Gerome R., 4,008,610.
Energy Research and Development Administration: *See*—
Carter, H. Kennon; and Mlekodaj, Ronald L., 4,008,899.
Farkas, Zoltan D.; and Wilson, Perry B., 4,009,444.
National Aeronautics and Space Administration: *See*—
Wilkins, Judd R.; and Stoner, Glenn E., 4,009,078.
Navy: *See*—
Bennion, Douglas N.; Hebbar, Ranna K.; and Deshpande, Sanjay L., 4,009,323.
Berg, Alan, 4,008,868.
Bocker, Richard P.; Bromley, Keith; Monahan, Michael A.; and Stotts, Larry B., 4,009,380.
Hanley, Stephen T., 4,009,392.
Martinez-dePison, Emilio, 4,009,420.
Talkington, Howard R., 4,008,606.
Waltz, Allen R.; and McCracken, Howard B., 4,009,452.
Wasserman, Bernard; and Thielbahr, William H., 4,009,231.
U.S. Philips Corporation: *See*—
de Brebisson, Michel; Monfret, Alain Gerard; and Decrouen, Jean-Michel, 4,009,057.
Habelt, Gerhard, 4,009,493.
Linmans, Rene Maurice, 4,009,070.
Mulder, Cornelis; and Wulms, Henricus Elisabeth Jozef, 4,009,397.
Schemmann, Hugo; and Bertram, Leo, 4,008,985.
Vos, Leonardus; van der Sanden, Joannes Theodorus; and Van Mensvoort, Adrianus Johannes, 4,008,591.
United States Steel Corporation: *See*—
Hudson, John W.; and Pendergrast, Robert A., 4,009,245.
Johnson, Robert L., 4,008,817.
Murray, Thomas P., 4,008,616.
United Technologies Corporation: *See*—
Brown, Wayne Myron; and Manente, Joseph Carmen, Jr., 4,008,977.
Cooper, Dean Earl; and Klingioff, Robert Fuller, 4,008,979.
Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,008,844.
Noehren, William Lawrence; and Hibyan, Edward Stanley, 4,008,980.
Universal Oil Products Company: *See*—
Schmerling, Louis, 4,009,203.
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Voorhees, John J., 4,009,282.
University of Nebraska, The Regents of the: *See*—
Satterlee, Lowell Duggan; Arnold, Roy Gary; and Anderson, Philip C., 4,009,390.
University of Virginia, The: *See*—
Gainer, James V., Jr., 4,009,270.
Wilkins, Judd R.; and Stoner, Glenn E., 4,009,078.
Uno, Keiichi: *See*—
Hayashi, Ikuya; Uno, Keiichi; and Matsuoka, Mikio, 4,009,312.
UOP Inc.: *See*—
Arndt, O. Harold, 4,008,920.
Carson, Don B., 4,009,095.
Hilfman, Lee, 4,009,120.
Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., 4,009,222.
Pollitzer, Ernest L.; and Hayes, John C., 4,009,096.
Pollitzer, Ernest L.; and Hayes, John C., 4,009,123.
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Ward, Dennis J., 4,009,097.
Upjohn Company, The: *See*—
Herr, Milton E.; and Johnson, Roy A., 4,009,283.
Hester, Jackson B., Jr., 4,009,175.
Hiemer, Armin Alexander; and Jager, Siegfried Hermann, 4,008,990.
Uskokovic, Milan Radoje: *See*—
Baggiolini, Enrico; Confalone, Pasquale Nicholas; Pizzolato, Giacomo; and Uskokovic, Milan Radoje, 4,009,172.
Usry, Gerald O., to General Electric Company. Externally actuated clamping system for transformer windings incorporating a mechanical follow-up device. 4,009,461, Cl. 336-197.000.
Usui, Tugumoto: *See*—
Kojima, Tamotsu; Sato, Shui; Endo, Takaya; Usui, Tugumoto; and Horiuchi, Tomio, 4,009,035.
Valayil, Silvester P.: *See*—
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,009,087.
Vanata, Steve G.: *See*—
Schlepphik, Alfred A.; and Vanata, Steve G., 4,009,253.
Vandamme, Detlef, to Siemens Aktiengesellschaft. Leak indicating apparatus for a closed cooling system of an electric machine. 4,008,755, Cl. 165-11.000.
Vandenberg, Edwin J., to Hercules Incorporated. Polymerization of epoxides. 4,009,128, Cl. 260-2.00A.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Spreading implements. 4,008,854, Cl. 239-655.000.
van der Lely, Cornelis. Spreading implements. 4,008,855, Cl. 239-682.000.
van der Sanden, Joannes Theodorus: *See*—
Vos, Leonardus; van der Sanden, Joannes Theodorus; and Van Mensvoort, Adrianus Johannes, 4,008,591.
Van Dest, Jean C., to Massey-Ferguson Services N.V. Synchronizing mechanism for change speed gears. 4,008,624, Cl. 74-339.000.
Vandewijer, Romain Gustave Edgard; and Degeest, Joseph Theo, to Raffinerie Tirlemontoise. Process for treating sugar-factory molasses. 4,009,046, Cl. 127-47.000.
van Dijk, Petrus Richardus Martinus: *See*—
Gilissen, Hermanus Petrus Johannes; and van Dijk, Petrus Richardus Martinus, 4,008,519.
Vanguard Machinery Corporation: *See*—
Pulda, William F., 4,008,890.
Van Hook, Danny Allen, to International Business Machines Corporation. Memory management system for an ink jet copier. 4,009,332, Cl. 358-280.000.
van Huis, Robert L., to U.S. Industries, Inc. Poultry cage system with poultry removal. 4,008,690, Cl. 119-82.000.
Vanlerberghe, Guy: *See*—
Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,009,255.
Van Mensvoort, Adrianus Johannes: *See*—
Vos, Leonardus; van der Sanden, Joannes Theodorus; and Van Mensvoort, Adrianus Johannes, 4,008,591.

Varian Associates: *See—*
Anderson, Richard C.; and Mathers, Marc G., 4,009,339.
De Koning, Joseph G.; Goldwasser, Robert E.; and Hamilton, Robert J., Jr., 4,009,446.
Rose, Peter H., 4,008,683.

Varta Batterie Aktiengesellschaft: *See—*
Schenk, Gerd; and Haake, Heinz, 4,009,053.

Vaughn, Bennie Joe: *See—*
Schafer, Richard Arthur; and Vaughn, Bennie Joe, 4,008,906.

Vecera, Milos; Skala, Josef; and Tesar, Oldrich, to Vyzkumny Ustav Bavlnarsky. Apparatus for supplying a staple fiber formation to a fiber separating device of an open-end spinning unit. 4,008,562, Cl. 57-58.950.

Vehicle Research Corporation: *See—*
Rethorst, Scott Carson, 4,008,866.

Veigel, Neil D., to Shatterproof Glass Corporation. Sputter-coating of glass sheets or other substrates. 4,009,090, Cl. 204-192.000.

Vercellotti, Leonard C.; and Hite, Perry J., Sr., to Westinghouse Electric Corporation. Acoustic emission monitoring system. 4,009,463, Cl. 340-16.00R.

Vering, Antonius: *See—*
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.

Vernay Laboratories, Inc.: *See—*
Tregillus, Kenneth C., 4,008,853.

Versapak (UK) Ltd: *See—*
Anderson, Michael Denny, 4,008,914.

Vertegaal, Jacobus Gerardus, to Stork Brabant B.V. Device for applying a layer of a viscous substance. 4,008,684, Cl. 118-123.000.

Vianova-Kunstharz, A.G.: *See—*
Ladstadter, Elmar, 4,009,364.

Vice, George A. Child proof cabinet. 4,008,934, Cl. 312-209.000.

Victor Company of Japan, Limited: *See—*
Ishigaki, Yukinobu; and Fukui, Kiyotake, 4,009,455.

Vidilles, Jacques. Safety reservoir for hydrocarbons and dangerous liquids. 4,008,831, Cl. 222-95.000.

Vignone, John F.: *See—*
Tullier, Leo D.; and Vignone, John F., 4,009,109.

Vilt, Anton L. Method and apparatus for positioning deformable pots in a predetermined array. 4,008,543, Cl. 47-1.00A.

Vinciguerra, Costantino, to Nuovo Pignone, S.p.A. Device for the transport of individual pieces of fabric in the automatic manufacture of products therefrom. 4,008,888, Cl. 271-18.300.

Vogt, James Lee: *See—*
Soteropulos, Gust; and Vogt, James Lee, 4,008,905.

Vogt, Paul, to Ebauches S.A. Timepiece having an oscillating regulating member. 4,008,565, Cl. 58-28.00D.

vonBebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. 6-Aza-3H-1,4-benzodiazepines. 4,009,271, Cl. 424-248.570.

von Bromssen, Knut Thorkel. Device which among a number of radio signals selects one specially marked radio signal. 4,009,442, Cl. 325-470.000.

von Eickstedt, Klaus-Wolf: *See—*
Kaupmann, Wilhelm; von Eickstedt, Klaus-Wolf; and Rahman, Salah-Eldin, 4,009,184.

Von Rutte, Richard: *See—*
Topfl, Rosemarie; and Von Rutte, Richard, 4,009,110.

von Strandtmann, Maximilian: *See—*
Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, 4,009,261.

von Voros, Geza, to Optograms, Inc. Digital electro-optical micrometer and gages. 4,008,523, Cl. 33-143.00L.

Voorhees, John J., to University of Michigan, The Regents of the. Treatment of proliferating skin diseases with prostaglandins. 4,009,282, Cl. 424-317.000.

Vora, Bipin V.: *See—*
Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., 4,009,222.

Vos, Leonardus; van der Sanden, Joannes Theodorus; and Van Mensvoort, Adrianus Johannes, to U.S. Philips Corporation. Device for zigzag folding of strip material. 4,008,591, Cl. 72-38.000.

Voss, Rolf: *See—*
Kraushaar, Jurgen; and Voss, Rolf, 4,008,754.

Vyzkumny Ustav Bavlnarsky: *See—*
Vecera, Milos; Skala, Josef; and Tesar, Oldrich, 4,008,562.

W. E. Hall Company: *See—*
Hall, Robert E.; and Lamar, Clyde, 4,008,592.

W. R. Grace & Co.: *See—*
Lowther, Frank Eugene, 4,009,416.

Wada, Kenichi: *See—*
Ogawa, Masaya; Enoguchi, Yuji; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 4,008,954.

Wagner, Kuno: *See—*
Mormann, Werner; and Wagner, Kuno, 4,009,152.

Wah, Wong Kam; and Kam, Ting Yuet. Joint for rattan poles. 4,008,971, Cl. 403-237.000.

Waite, Jerry M., to Mobil Oil Corporation. Oil recovery by low tension waterflooding. 4,008,767, Cl. 166-273.000.

Wakeman, Alfred W. Ratchet wrench. 4,008,636, Cl. 81-68.000.

Waldon, Paul L.; and Bennett, Ronald E., to General Electric Company. Electrical apparatus with heat pipe cooling. 4,009,417, Cl. 361-38.000.

Walker, Grant W., to Dynamics Research and Manufacturing, Inc. Impact barrier for vehicles. 4,008,915, Cl. 293-60.000.

Walker, Harold G.: *See—*
Boone, James A.; Lewallen, Dennis L.; and Walker, Harold G., 4,008,770.

Walker, John H., to Phillips Petroleum Company. Printable anti-blocking resinous block copolymer. 4,009,295, Cl. 427-40.000.

Wallace-Murray Corporation: *See—*
Bremer, Robert Charles, Jr.; and Haupt, Hans Otto, 4,008,600.

Wallace, Paul W.; and Boys, John T., to Standard Pressed Steel Co. Tightening system. 4,008,773, Cl. 173-12.000.

Walon, Raoul Guillaume Philippe, to CPC International Inc. Preparation of levulose from granular starch. 4,009,074, Cl. 195-31.00F.

Walther, William D.; and DeRegnaucourt, Robert A., to Dayton-Walther Corporation. Rim, wheel and fastening means assembly. 4,008,923, Cl. 301-12.00R.

Waltz, Allen R.; and McCracken, Howard B., to United States of America, Navy. Submersible power package. 4,009,452, Cl. 331-68.000.

Walworth, Bryant Leonidas, to American Cyanamid Company. 1,2-Dialkyl-3,4,5-trisubstituted pyrazolium salts as fungicidal agents. 4,009,277, Cl. 424-273.000.

Wandelmaier, Frank W.: *See—*
Warkentin, John; Ramakrishnan, Kottieth; Jain, Rup C.; and Wandelmaier, Frank W., 4,009,276.

Wanek, Leonard F. Bathroom accessory. 4,008,933, Cl. 312-206.000.

Wang, Tsu-Huai: *See—*
Healy, Lawrence W.; Wang, Wu Lan; and Wang, Tsu-Huai, 4,009,315.

Wang, Wu Lan: *See—*
Healy, Lawrence W.; Wang, Wu Lan; and Wang, Tsu-Huai, 4,009,315.

Wanger, W. Hunter, to Rohm and Haas Company. Soil hiding, soil resistant fiber comprising a relatively major amount of a polyamide component and a minor amount of an acrylate polymer component. 4,009,316, Cl. 428-364.000.

Ward, Dennis J., to UOP Inc. Separation process. 4,009,097, Cl. 208-342.000.

Warkentin, John; Ramakrishnan, Kottieth; Jain, Rup C.; and Wandelmaier, Frank W., to Canadian Patents and Development Limited. Oxadiazoline derivatives. 4,009,276, Cl. 424-272.000.

Warner-Lambert Company: *See—*
Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, 4,009,261.

Warnken, Gerald H., to Minnesota Mining and Manufacturing Company. Epoxy resin powder including ethylene vinyl acetate. 4,009,224, Cl. 260-837.00R.

Warren, George D.: *See—*
Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 4,009,140.

Washington, Harold; and Kozi, Martin, to Instrumentation & Control Systems, Inc. Skipping sine wave pulse plater system. 4,009,091, Cl. 204-228.000.

Wasserman, Bernard; and Thielbahr, William H., to United States of America, Navy. Powder barrier bonding technique. 4,009,231, Cl. 264-3.00R.

Wasserman, Jacob F.: *See—*
Olinger, Charles P.; and Wasserman, Jacob F., 4,008,711.

Water Refining Company, Inc.: *See—*
Davis, Stephen H., 4,009,102.

Weatherford, Larry Green, Jr., to Babcock & Wilcox Company, The. Industrial technique. 4,008,757, Cl. 165-67.000.

Webber, Hugh C., to Essex International, Inc. Magnetic circuit apparatus for an electronic ignition system of a combustion engine. 4,008,701, Cl. 123-148.00E.

Weber, Heinrich; Choulat, Gustav; and Laufhutte, Dieter, to Carl Still, Firma. Continuous process for scrubbing out hydrogen sulfide and ammonia from coke oven gas. 4,009,243, Cl. 423-234.000.

Webers, Theo: *See—*
Kral, Leopold; Finke, Klaus-Gunter; and Webers, Theo, 4,008,814.

Wegscheid, Edmund Lawrence; and Cofer, Larry Wilson, to Deere & Company. Isolated harvester cutter bar. 4,008,556, Cl. 56-12.600.

Wehr Corporation: *See—*
Barrett, William T., 4,008,799.

Weinert, Harry F.: *See—*
Farmer, Stanley E.; Faust, Donald M.; and Weinert, Harry F., 4,008,648.

Weiss, Herbert K., to Litton Systems, Inc. Predicted - corrected projectile control system. 4,008,869, Cl. 244-3.130.

Welch, John Alan, to General Tire & Rubber Company, The. Pneumatic tire with puncture resistance internal safety structure. 4,008,743, Cl. 152-158.000.

Weldon, James M., to Cameron Iron Works, Inc. Well apparatus. 4,008,898, Cl. 277-116.200.

Wells, Harold D., to Black Body Corporation. Multiple tier oven. 4,008,996, Cl. 432-128.000.

Welschof, Hans-Heinrich, to Lohr & Bromkamp GmbH. Constant velocity universal joint. 4,008,582, Cl. 64-21.000.

Wember, Kurt: *See—*
List, Ferdinand; and Wember, Kurt, 4,009,199.

Wendel, Martin Maurice, to Du Pont de Nemours, E. I., and Company. Manufacture of nitrates. 4,009,246, Cl. 423-385.000.

Wentworth, Donald, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Seals for rotating shafts, especially for stern tube seals for ships. 4,008,897, Cl. 277-9.000.

West, Lynn P.: *See—*
Flemming, Donald C.; Markey, Harold G.; Metz, Ralph J.; and West, Lynn P., 4,009,347.

Markey, Harold G.; and West, Lynn P., 4,009,343.
Parker, Brian E.; and West, Lynn P., 4,009,346.

West Virginia Armature Co., Inc.: *See*—
Nelson, Robert C., 4,008,797.

Western Railspan Inc.: *See*—
Gardner, Harry R.; and Marlatt, Charles D., 4,008,870.

Westinghouse Air Brake Company: *See*—
Clemmons, Quentin T., 4,008,789.
Darrow, John O. G., 4,009,403.
Darrow, John O. G., 4,009,454.

Westinghouse Electric Corporation: *See*—
Hopwood, Francis W.; and Staley, Lester K., 4,009,448.
Noonan, Charles M., 4,009,223.
Pierce, Robert E., 4,008,685.
Vercellotti, Leonard C.; and Hite, Perry J., Sr., 4,009,463.

Wetherell, Thomas J.: *See*—
Kazis, Earle W.; Mark, Robert; and Wetherell, Thomas J., 4,009,051.

Whisler, Edwin Lee: *See*—
Schulte, Gary Lee; and Whisler, Edwin Lee, 4,008,626.

White, Chester N.; and Lindsay, John F., to Sun Oil Company of Pennsylvania. Valve for pneumatic tube transporting system. 4,008,865, Cl. 243-6.000.

White, Howard S.; and Casciato, Leonard, to Peat, Marwick and Partners. Monitoring system for vehicles. 4,009,375, Cl. 235-150.240.

Whitt, James A., to General Electric Company. Lubrication system. 4,008,787, Cl. 184-12.000.

Whitt, James A., to General Electric Company. Lubrication system including lubricant-storing discrete foam particles. 4,008,788, Cl. 184-12.000.

Whittingham, M. Stanley, to Exxon Research and Engineering Company. Chalcogenide battery. 4,009,052, Cl. 429-191.000.

Wickman Machine Tool Sales Limited: *See*—
Gilbert, Harold James, deceased; and McConnell, Edmund Alexander, 4,008,633.
Gilbert, Harold James, deceased; and McConnell, Edmund Alexander, 4,008,635.

Widder, Rudi; Diessel, Paul; and Distler, Dieter, to BASF Aktiengesellschaft. Opacifying agents. 4,009,139, Cl. 260-29.6RW.

Wildlife Vaccines, Inc.: *See*—
Ament, Roland W.; and Fender, Daniel C., 4,009,259.

Wildschut, Jan H., to Stamicarbon B.V. Structural element. 4,008,932, Cl. 312-198.000.

Wilkins, Judd R.; and Stoner, Glenn E., to United States of America, National Aeronautics and Space Administration; and University of Virginia, The. Detecting the presence of microorganisms. 4,009,078, Cl. 195-103.50R.

Williams, Clarence Alfred: *See*—
Arney, William Charles; Williams, Clarence Alfred; and Glass, Joseph Edward, Jr., 4,009,329.

Williams, Lewis D.: *See*—
Huber, Wolfgang; Saifer, Mark G.; and Williams, Lewis D., 4,009,267.

Williams, Thomas Walley, III: *See*—
Schreiber, Sally Ann; and Williams, Thomas Walley, III, 4,009,381.

Wilmes, Raymond G. Bale unrolling device. 4,008,862, Cl. 242-86.50R.

Wilson, Edward A., to Honeywell Information Systems, Inc. Liquid cooled heat exchanger for electronic power supplies. 4,009,423, Cl. 361-385.000.

Wilson, Perry B.: *See*—
Farkas, Zoltan D.; and Wilson, Perry B., 4,009,444.

Wilson, Robert Burr; and Cochran, Steven Maitland. Elongated article feeding and driving mechanism. 4,008,842, Cl. 227-117.000.

Wingert, Rudolf, to Presto Lock Company, Division of Walter Kidde & Comany, Inc. Draw bolt. 4,008,584, Cl. 70-73.000.

Wintzer, Manfred: *See*—
Niedermeier, Karl; and Wintzer, Manfred, 4,009,238.

Winzer, Gerhard: *See*—
Baues, Peter; Mahlein, Hans; Reichelt, Achim; and Winzer, Gerhard, 4,008,947.

Witt, Donald R., to Phillips Petroleum Company. Polymerization of olefins. 4,009,327, Cl. 526-96.000.

Wittmann-Liebold, Brigitte; Graffunder, Horst; and Kohls, Heinz. Valve arrangement for distributing fluids. 4,008,736, Cl. 137-606.000.

Woehrle, Richard E., to M & T Chemicals Inc. Lubricating coating for metal sheet. 4,009,085, Cl. 204-27.000.

Woehrn, Daniel: *See*—
Berger, Jean-Luc; and Woehrn, Daniel, 4,009,333.

Wojtowicz, John A.: *See*—
Ardis, Alan E.; and Wojtowicz, John A., 4,009,182.

Wolf, Alby Henry, to Gould Inc. Battery cover for facilitating the draining of liquid from the battery when inverted. 4,009,322, Cl. 429-175.000.

Wolf, Hans-Joachim; Meier, Franz; and Baumgartner, Hans Ulrich, to Kistler Instrumente AG. Amplifier arrangement with zeroing device for piezoelectric transducers. 4,009,447, Cl. 330-110.000.

Wolf, Ludwig, Jr.: *See*—
Miller, Jimmy L.; Salkin, Burton; Schnell, William J.; and Wolf, Ludwig, Jr., 4,009,107.

Wood, Eric, to Insituform (Pipes and Structures) Limited. Method of lining a pipe. 4,009,063, Cl. 156-71.000.

Woodfill, Ernest L., to Buckbee-Mears Company. Lightning arrester construction. 4,009,422, Cl. 361-120.000.

Woods, Robert L., to United States of America, Army. Fluidic partial pressure sensor. 4,008,601, Cl. 73-23.000.

Woollenweber, William E., Jr., to Cummins Engine Company, Inc. Turbine housing. 4,008,572, Cl. 60-602.000.

Wordell, David Hazard, Sr. Retractible rudder. 4,008,677, Cl. 114-162.000.

Wortmann, Joachim: *See*—
Dany, Franz-Josef; Wortmann, Joachim; and Kandler, Joachim, 4,009,137.

Wren, William Arthur, Jr.; and Gibson, Joseph Paul, Jr. Collapsible playpen. 4,008,499, Cl. 5-99.00C.

Wulms, Henricus Elisabeth Jozef: *See*—
Mulder, Cornelis; and Wulms, Henricus Elisabeth Jozef, 4,009,397.

Wurr, Jurgen: *See*—
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.

Xerox Corporation: *See*—
Bar-on, Ari, 4,008,955.
Buckley, David A., 4,009,249.
Clark, Harold E., 4,009,466.
Goffe, William L., 4,009,028.
Kingsland, David O., 4,008,958.
May, Joseph N., 4,009,034.
Pearson, James M.; and Yanus, John F., 4,009,151.
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Seachman, Ned J., 4,009,388.
Stemmle, Denis L., 4,008,956.
Summers, James E., 4,008,957.

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Yamada, Masatora; Tasaka, Shigeo; Okawa, Tadayuki; and Suzuki, Taichi, to Mitsubishi Petrochemical Company Limited. Treating device for synthetic resin waste. 4,008,858, Cl. 241-101.200.

Yamada, Minoru: *See*—
Arai, Atsuaki; Ohi, Reiichi; Yamada, Minoru; Yokoo, Kenji; and Hara, Hiroshi, 4,009,038.

Yamaha, Hatsudoki Kabushiki Kaisha: *See*—
Juto, Yasuro; and Suzuki, Keisuke, 4,008,777.

Yamamoto, Hisao: *See*—
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,009,275.
Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, 4,009,173.

Yamamoto, Sigeo: *See*—
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichiro; Ooishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.

Yamamoto, Takehiko: *See*—
Tsujino, Kazuaki; Kida, Junnosuke; Hosotani, Masanobu; Minamiura, Noshi; and Yamamoto, Takehiko, 4,009,079.

Yamamoto, Yukiharu: *See*—
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Katakura, Hiroshi; and Yamashita, Keitaro, 4,008,686.

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Pozzo, James A.; and Yan, Maxwell M., 4,009,073.

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Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsahide; Mori, Tamiki; and Yasutomi, Yasuo, 4,009,206.

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Yokoo, Kenji: *See*—
Arai, Atsuaki; Ohi, Reiichi; Yamada, Minoru; Yokoo, Kenji; and Hara, Hiroshi, 4,009,038.

Yokose, Yoshikazu: *See*—
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; and Shibano, Takashi, 4,009,306.

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Okumori, Toshio; Tadokoro, Yozo; Takagi, Yoshiyuki; and Yoshida, Nobuo, 4,009,290.
Yoshikuni, Yoshiaki: *See*—
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsahide; Mori, Tamiki; and Yasutomi, Yasuo, 4,009,206.
Yoshino, Hiroyuki: *See*—
Shinoda, Akibumi; and Yoshino, Hiroyuki, 4,008,779.
Youden, David H.: *See*—
Hahn, Robert S.; Holmstrom, Bruno A.; St. Andre, Arthur F.; and Youden, David H., 4,008,631.
Young, Alastair John, to Automotive Products Company Limited. Valve devices for use in liquid pressure braking systems of vehicles. 4,008,925, Cl. 303-6.00C.
Young, Dora M. Knotless tatting. 4,008,643, Cl. 87-10.000.
Young, Einar T., to Suntech, Inc. Electro-mechanical counting register. 4,009,373, Cl. 235-92.0FL.
Young, Eugene R.: *See*—
Spears, Esten W., Jr.; and Young, Eugene R., 4,008,568.
Young, John E., Jr.: *See*—
Massoth, Franklin E.; and Young, John E., Jr., 4,009,009.
Youngman, David R. Carpet stretcher. 4,008,879, Cl. 254-57.000.
Younkin, James R., to Edo-Aire Mitchell Industries, Inc. Flight instrument. 4,008,618, Cl. 73-387.000.
Youssef, Hassan, to La Metallurgie Francaise des Poudres Metafram. Method of testing the qualities of a material. 4,008,622, Cl. 73-432.00R.
Yu, Pyung K.: *See*—
Yih, Roy Y.; and Yu, Pyung K., 4,009,021.
Yurko, Joseph A., to Colgate-Palmolive Company. Non-phosphate detergent composition. 4,009,114, Cl. 252-109.000.
Zahariev, Stefan Elenkov: *See*—
Petrov, Radoslav Stanev; Zahariev, Stefan Elenkov; Markov, Ivan Kirilov; and Peychev, Georgi Vassilev, 4,008,596.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Iinuma, Hironobu; and Tanabe, Osamu, 4,009,155.
Zanoni, Louis A.: *See*—
Luce, Nunzio A.; and Zanoni, Louis A., 4,008,564.
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Zegel, Snyder M. Educational accounting device. 4,008,527, Cl. 35-24.00R.
Zeloyle, Daniel J., to Burrell Industrial Supply Company. Stand for a projected image viewing apparatus. 4,008,935, Cl. 312-252.000.
Zenith Aviation: *See*—
Courant, Jacques; Gonnet, Robert; and Thore, Marc, 4,008,733.
Zielinski, Stanley A.: *See*—
Payne, Robert A.; Slobodzian, Gregory E.; Zielinski, Stanley A.; and Ravanesi, Ralph M., 4,009,335.
Zikov, Kostadin Zikov: *See*—
Kalev, Lyubomir Tzonev; Zikov, Kostadin Zikov; and Marvakov, Ivan Kirilov, 4,009,365.
Ziman, Stephen David, to Du Pont de Nemours, E. I., and Company. Di- and tri-substituted oxazolidin-2-one oximes. 4,009,179, Cl. 260-307.0FA.
Zimmerman, Robert L.; Austin, Thomas H.; and Schulze, Heinz, to Texaco Development Corporation. Preparation of isocyanurate foams using alkali metal tertiaryamino dithiocarbamate salt catalysts. 4,009,130, Cl. 260-2.5AB.
Zinser Textilmaschinen GmbH: *See*—
Grau, Gerhard, 4,008,561.
Zjukin, Nikolai Stepanovich: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Feldgun, Leon Izrailevich; Drui, Mark Simonovich; Kostjuk, Boris Dmitrievich; Zjukin, Nikolai Stepanovich; Lysanov, Vladislav Sergeevich; and Lavrinovich, Alla Alexandrovna, 4,009,027.
Zola, Heddy: *See*—
Thomas, Derek; and Zola, Heddy, 4,009,257.
Zubieta, Robert Frutos. Blender. 4,008,883, Cl. 259-108.000.

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,452	3,595,243	Feb. 10, 1976	Nov. 30, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,403	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bianchini, Gianni, to Societa Italiana Elettronica S.p.A. Fail-safe apparatus for checking the presence of flame in a burner. Re. 29,143, Cl. 361-175.000.

Consiglio Nazionale delle Richerche: *See—*
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.

Coulter Electronics, Inc.: *See—*
Hogg, Walter R., Re. 29,141.

Eggers, Edward T.: *See—*
Mast, Aquila D.; and Eggers, Edward T., Re. 29,140.

Hogg, Walter R., to Coulter Electronics, Inc. Apparatus for orienting generally flat particles for sensing. Re. 29,141, Cl. 356-36.000.

Mast, Aquila D.; and Eggers, Edward T., to Sperry Rand Corporation. Hay roll forming machine. Re. 29,140, Cl. 56-341.000.

Messner, Carlton E. Lawn maintenance equipment. Re. 29,139, Cl. 56-13.100.

Montefinale, Alberto C.: *See—*
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.

Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., to Consiglio Nazionale delle Richerche. Combustible compositions for generating aerosols, particularly suitable for cloud modification and weather control and aerosolization process. Re. 29,142, Cl. 252-305.000.

Petriconi, Gianna L.: *See—*
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.

Societa Italiana Elettronica S.p.A.: *See—*
Bianchini, Gianni, Re. 29,143.

Sperry Rand Corporation: *See—*
Mast, Aquila D.; and Eggers, Edward T., Re. 29,140.

Zawidzky, Tadeusz W.: *See—*
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.

LIST OF PLANT PATENTEES

de Ruiter, Gijsbert, to Jackson & Perkins Co. Rose plant. 4,018, 2-22-77, Cl. 27.000.

Jackson & Perkins Co.: *See—*
de Ruiter, Gijsbert, 4,018.

Royon, Rene, to Universal Plants S. A. R. L. Rose plant-pitica variety. 4,017, 2-22-77, Cl. 18.000.

Universal Plants S. A. R. L.: *See—*
Royon, Rene, 4,017.

LIST OF DESIGN PATENTEES

Aerovironment Inc.: *See—*
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., 243,450.

Airco, Inc.: *See—*
Verini, Nicholas A., 243,455.

Anchor Hocking Corporation: *See—*
Benes, Frank J., 243,431.
Benes, Frank J., 243,433.
Benes, Frank J.; and Thrush, James Lloyd, 243,463.
Thrush, James Lloyd, 243,428.
Thrush, James Lloyd, 243,429.
Thrush, James Lloyd, 243,430.

Atlas Copco Aktiebolag: *See—*
Zernell, Stig Rune, 243,439.

Avery, Roger E. Therapeutic electrode pad. 243,476, 2-22-77, Cl. D83-1.00F.

Batley, Ray E. Rake for spreading insulation in building structures. 243,438, 2-22-77, Cl. D8-16.000.

Bell Industries: *See—*
Khoury, Nasim, 243,445.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Desk top accounting machine. 243,461, 2-22-77, Cl. D64-11.00B.

Benes, Frank J., to Anchor Hocking Corporation. Goblet or similar article. 243,431, 2-22-77, Cl. D7-11.000.

Benes, Frank J., to Anchor Hocking Corporation. Pitcher or similar article. 243,433, 2-22-77, Cl. D7-64.000.

Benes, Frank J.; and Thrush, James Lloyd, to Anchor Hocking Corporation. Vase or similar article. 243,463, 2-22-77, Cl. D11-146.000.

Bentas, Christos J. Cemetery memorial monument. 243,466, 2-22-77, Cl. D31-17.000.

Bliss, Theodore J., to Saban Electric Corporation. Welding machine. 243,459, 2-22-77, Cl. D15-144.000.

Bridgestone Tire Company Limited: *See—*
Hayakawa, Toshio; and Nakamura, Masao, 243,449.

CITC Industries, Inc.: *See—*
Cohen, William J., 243,421.

Cohen, William J., to CITC Industries, Inc. Sport shoe. 243,421, 2-22-77, Cl. D2-310.000.

Collection Corporation: *See—*
Friedland, Samuel J., 243,453.

Cone, Richard E. R., to Plastics Manufacturing Company. Pitcher. 243,434, 2-22-77, Cl. D7-64.000.

Corning Glass Works: *See—*
Mercadante, Ottorino N., 243,432.

Cutruzzula, Jeffrey F.; and Schattner, Robert L., to Omnimed, Inc. Intravenous tube anchor. 243,477, 2-22-77, Cl. D24-52.000.

Durst AG Fabrik Fototechnischer Apparate: *See—*
Gandini, Mario, 243,452.

Foster Industries Co., Ltd.: *See—*
Leung, Chung Sum, 243,474.

Fratelli Saporiti: *See—*
Offredi, Giovanni, 243,424.
Rosselli, Alberto, 243,423.

Frazier, Lawrence M. Physiological sensor for placement on the skin of humans or animals to detect electrical activity in the localized region thereof. 243,475, 2-22-77, Cl. D83-1.00F.

Freeman, Delores S. Fluorescent table lamp. 243,473, 2-22-77, Cl. D48-20.00R.

Friedland, Samuel J., to Collection Corporation. Illuminable calendar holder or similar article. 243,453, 2-22-77, Cl. D19-20.000.

Fuji Photo Film Co., Ltd.: *See—*
Mizukawa, Shigeo, 243,451.

Gandini, Mario, to Durst AG Fabrik Fototechnischer Apparate. Color mixing head for a photographic enlarging apparatus. 243,452, 2-22-77, Cl. D16-34.000.

Gibson, Sidney. Chair. 243,425, 2-22-77, Cl. D6-75.000.

Greene, Michael L. Bird house. 243,464, 2-22-77, Cl. D30-03.000.

Greene, Michael L. Bird feeder. 243,465, 2-22-77, Cl. D30-14.000.

Greenfield, John; Kneale, Collan B.; and Wilkey, Frank, Jr., to International Business Machines Corporation. Portable personal computer. 243,460, 2-22-77, Cl. D14-45.000.

Hayakawa, Toshio; and Nakamura, Masao, to Bridgestone Tire Company Limited. Vehicle tire. 243,449, 2-22-77, Cl. D12-142.000.

Hayashi, Tadaaki. Combined display card and holder for a cylindrical article. 243,443, 2-22-77, Cl. D9-191.000.

Hoffman, Beulah J. Combined table place mat and napkin holder. 243,435, 2-22-77, Cl. D7-72.000.

Horizon Industries, Inc.: *See—*
Spirer, Peter R., 243,479.

Ing. C. Olivetti & C., S.p.A.: *See*—
Bellini, Mario, 243,461.
International Business Machines Corporation: *See*—
Greenfield, John; Kneale, Collan B.; and Wilkey, Frank, Jr., 243,460.
International Silver Company: *See*—
Knope, William J., 243,437.
Interstate Sports, Inc.: *See*—
Smith, Grover C., III; and Smith, Thomas M., 243,447.
Jones, Ralph Godfrey, to Preci-Spark Limited. Combined mirror and stand therefor. 243,478, 2-22-77, Cl. D28-65.000.
Joslyn, John A. Hot comb holder. 243,426, 2-22-77, Cl. D6-125.000.
Karrh, Randolph C.: *See*—
Nipper, William U., Jr., 243,469.
Kerr, Donald R.: *See*—
Kerr, Marvin D.; and Kerr, Donald R., 243,454.
Kerr, Marvin D.; and Kerr, Donald R. Storage tank. 243,454, 2-22-77, Cl. D23-2.000.
Khoury, Nasim, to Bell Industries. Boat. 243,445, 2-22-77, Cl. D12-62.000.
Kleiner, Carl J. Pendant. 243,470, 2-22-77, Cl. D11-6.000.
Kneale, Collan B.: *See*—
Greenfield, John; Kneale, Collan B.; and Wilkey, Frank, Jr., 243,460.
Knope, William J., to International Silver Company. Article of flatware. 243,437, 2-22-77, Cl. D7-137.000.
Kouvelas, George. Tennis racquet frame. 243,467, 2-22-77, Cl. D34-5.0ST.
Krapowicz, Jacob A., to Sperry Rand Corporation. Combined electric shaver and cover therefor. 243,480, 2-22-77, Cl. D28-49.000.
Leung, Chung Sum, to Foster Industries Co., Ltd. Portable fluorescent lantern. 243,474, 2-22-77, Cl. D48-24.00R.
Leung, Jhi Hung, to Star Industrial Co., Ltd. Lamp shade. 243,472, 2-22-77, Cl. D48-16.00D.
Levey, Irving N. Game board. 243,468, 2-22-77, Cl. D34-5.0TT.
Lissaman, Peter B. S.: *See*—
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., 243,450.
Livingston, David T., to Reinell Boats, Inc. Sailboat. 243,446, 2-22-77, Cl. D12-64.000.
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., to Aerovironment Inc. Aerodynamic drag reduction device for vehicles. 243,450, 2-22-77, Cl. D12-181.000.
Max Factor & Co.: *See*—
Montgomery, Robin M., 243,442.
Mercadante, Ottorino N., to Corning Glass Works. Plate or the like. 243,432, 2-22-77, Cl. D7-36.000.
Miller, Daniel L. Clock face. 243,444, 2-22-77, Cl. D10-8.000.
Mizukawa, Shigeo, to Fuji Photo Film Co., Ltd. Movie camera. 243,451, 2-22-77, Cl. D16-04.000.
Montgomery, Robin M., to Max Factor & Co. Bottle. 243,442, 2-22-77, Cl. D9-73.000.
Nakamura, Masao: *See*—
Hayakawa, Toshio; and Nakamura, Masao, 243,449.
Nipper, William U., Jr., to Karrh, Randolph C. Rocking toy. 243,469, 2-22-77, Cl. D34-5.00D.
Offredi, Giovanni, to Fratelli Saporiti. Upholstered seat. 243,424, 2-22-77, Cl. D6-71.000.
Omnimed, Inc.: *See*—
Cutruzzula, Jeffrey F.; and Schattner, Robert L., 243,477.
Pall Corporation: *See*—
Pall, David B., 243,458.
Pall, David B., to Pall Corporation. Filter. 243,458, 2-22-77, Cl. D23-4.000.
Plastics Manufacturing Company: *See*—
Cone, Richard E. R., 243,434.
Podd, Alexander L. Hook. 243,441, 2-22-77, Cl. D8-367.000.
Preci-Spark Limited: *See*—
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Ryan, Bobby W., to WFI International, Inc. Welding outlet. 243,456, 2-22-77, Cl. D23-40.000.
Ryan, Bobby W., to WFI International, Inc. Welding outlet. 243,457, 2-22-77, Cl. D23-40.000.
Saban Electric Corporation: *See*—
Bliss, Theodore J., 243,459.
Schattner, Robert L.: *See*—
Cutruzzula, Jeffrey F.; and Schattner, Robert L., 243,477.
Schroeder, Peter E. Curtain material. 243,471, 2-22-77, Cl. D47-6.00E.
Senger, Gerhard Franz-Josef, to Uniroyal A.G. Pneumatic tire tread and buttress. 243,448, 2-22-77, Cl. D12-136.000.
Smith, Grover C., III; and Smith, Thomas M., to Interstate Sports, Inc. Foot lever for motorcycles. 243,447, 2-22-77, Cl. D12-114.000.
Smith, Thomas M.: *See*—
Smith, Grover C., III; and Smith, Thomas M., 243,447.
Sperry Rand Corporation: *See*—
Krapowicz, Jacob A., 243,480.
Spirer, Peter R., to Horizon Industries, Inc. Textile pile fabric. 243,479, 2-22-77, Cl. D92-1.0AA.
Star Industrial Co., Ltd.: *See*—
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String-Sceffic Mobelfabrik AB: *See*—
Strinning, Nils Erik, 243,440.
Strinning, Nils Erik, to String-Sceffic Mobelfabrik AB. Support hook for shelves or the like. 243,440, 2-22-77, Cl. D8-381.000.
Sud, Margaret D. String fish sculpture. 243,462, 2-22-77, Cl. D11-158.000.
Thrush, James Lloyd, to Anchor Hocking Corporation. Covered food bowl or similar article. 243,428, 2-22-77, Cl. D7-5.000.
Thrush, James Lloyd, to Anchor Hocking Corporation. Covered food bowl or similar article. 243,429, 2-22-77, Cl. D7-5.000.
Thrush, James Lloyd, to Anchor Hocking Corporation. Covered food bowl or similar article. 243,430, 2-22-77, Cl. D7-5.000.
Thrush, James Lloyd: *See*—
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Varga, Ilona D. Tongue brush. 243,422, 2-22-77, Cl. D4-25.000.
Verini, Nicholas A., to Airco, Inc. Cryogenic liquid storage vessel. 243,455, 2-22-77, Cl. D23-2.000.
Vida, Kenneth J. Barbecue grill. 243,436, 2-22-77, Cl. D7-107.000.
Watts, William R. Frame for a seat. 243,427, 2-22-77, Cl. D6-191.000.
WFI International, Inc.: *See*—
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CLASSIFICATION OF PATENTS

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NOTE—First number, class; second number, subclass; third number, patent number

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